

**FINAL
Remedial Investigation Report
for the
Radiation Technology Incorporated
Superfund Site, Operable Unit 3
Rockaway Township, New Jersey**

Contract No. W912DQ-11-D-3006

December 2013

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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R2-0001752



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Brian Quinn
United States Environmental Protection Agency, Region 2
290 Broadway, 19th Floor
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September 4, 2013

Re: Draft Remedial Investigation Report, OU3, dated August 6, 2013
Radiation Technology, Inc. (RTI)
Rockaway Twp. Morris County
SRP PI No. 019440; EA No. RPC000003

Dear Mr. Quinn:

The New Jersey Department of Environmental Protection (Department) has completed its review of the Draft Remedial Investigation Report, Operable Unit 3 (OU-3), dated August 6, 2013 for the Radiation Technology Inc. (RTI) Superfund Site in Rockaway Township, Morris County, NJ submitted pursuant to CERCLA and the Technical Requirements for Site Remediation at N.J.A.C. 7:26E (TRSR). The Department has the following comments:

1. Section 1.2, Site Description, Page 1-2, 1st paragraph: The document references that the RTI Superfund Site encompasses 5 areas over approximately 263 acres. The document also references that only 3 of these areas (South Stand, East Stand and P2) were investigated under this RI. The document provides limited information on the other areas (RTI and Undeveloped Land) and operable units (OU1 and OU2) for the site. Section 1.2 and Section 2.1 should be revised to discuss all operable units (i.e. OU1, OU2 and OU3), and all areas they encompass and media investigated at each, including a more detailed discussion as to why OU3 RI activities are limited to only some buildings and structures on the site.

Response: Do Not Concur, the Draft Remedial Investigation Report, Operable Unit 3 (OU-3), dated August 6, 2013 for the Radiation Technology Inc. (RTI) Superfund Site is for OU-3, which includes only the buildings and structures within the South Stand, East Stand, and P2 areas. No buildings/structures are present in the Undeveloped Land. Areas not included in the OU-3 RI report were covered in previous reports.

2. Section 1.2, Site Description, Page 1-2, 2nd paragraph: The document references that 34 buildings were identified in OU3 in the 2012 Tech Memo, and that 26 needed additional evaluation under this RI. The document then stated that the number was later reduced to 25. The document should provide additional clarification on why the Waste Disposal Area was removed from further evaluation. In addition, the Department found the document lacking a summary table of buildings/structures that were evaluated in the 2012 Tech Memo and brought forward into this RI. The document should be revised to include a summary table of all buildings/structures investigated in OU3, referencing those carried forward into this RI. The summary table should also reference

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any historic sampling, and sampling proposed under this RI. The document should also include a figure that clearly identifies all the building/structures including evaluation for National Historic Registry eligibility (e.g. guard house, water towers, etc.).

Response: Do Not Concur, the EPA team decided during the development of the *Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3* (Final dated April 18, 2013 provided to the NJDEP) that the Waste Disposal Area would be removed from further evaluation as no buildings/structures were present in the area. Historic sampling performed prior to the OU-3 RI is summarized in the *Technical Evaluation Memorandum for the Radiation Technology Superfund Site, Operable Unit 3*, (Tech Memo) dated December 3, 2012. A copy of this document has been provided to the NJDEP along with the Final Remedial Investigation Report, Operable Unit 3 (OU-3), for the Radiation Technology Inc. (RTI) Superfund Site. Appendix A of the OU-3 RI, *Hartgen Data Summary report, National Register Eligibility Evaluation of the Radiation Technology OU3 Superfund Site*, clearly identifies all the buildings/structures included in the evaluation for National Historic Registry eligibility.

3. Section 1.3 Analytical Data Screening Process, Pages 1-3 and 1-4: Though the document states, “The analytical results were screened against the screening criteria presented in the QAPP”, the document does not reference the screening criteria for soil, cinderblock, concrete or caulk. Please note, the soil, cinderblock and concrete samples should be compared to the Department’s Residential and Non-Residential Direct Contact Soil Remediation Standards (RDSCRS and NRDCRS). The document also states that “water samples” were screened against the Department’s Surface Water Quality Standards (Fresh Water-FW2). The Department requests clarification on why the water samples were screened against these standards and not the Department’s Groundwater Quality Standards (GWQS) or those necessary for proper disposal. In addition, the document states “...various bulk samples were compared with...EPA Screening Tables (Mary 2013).” The document should be revised to define the term “various bulk samples.” Finally, the Department finds the standards/criteria referenced in this section not consistent with those referenced in Section 4.1.1 or in the subsequent sections of the document. The document should be revised to be consistent, using the appropriate standards/criteria for each media.

Response: Do Not Concur, screening criteria used in the OU-3 RI report were agreed to by the EPA project team as appropriate, which was provided to the NJDEP in the *Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3* (Final dated April 18, 2013). The document has been revised to define the term “various bulk samples.” The standards/criteria referenced in this section have been revised to be consistent with those referenced in Section 4.1.1 and in the subsequent sections of the document.

4. Figure 1-1 Site Location Map: Figure 1-1 outlines only the “Project Site” as defined by OU3 investigation (i.e. East Stand, South Stand, and P2 Areas). Figure 1-1 should be revised to outline/reference the entire site which also includes the RTI Area and the Undeveloped Land.

Response: Concur, the figure has been revised as requested.

5. Figure 1-2 Previous Sample Locations: The Department finds that though Figure 1-2 references “previous sample locations”, no other information was included in the RI. The document should be revised to include additional information on these “previous sample locations.”

Response: Do Not Concur, the EPA team decided that it was sufficient to document in the Tech Memo the performance of the previous sampling (see response to comment 2).

6. Section 2.2 Summary of OU3 Previous Investigations, Page 2-3, 1st paragraph: The document states, “No investigations were completed in the RTI Area for OU3 prior to October 2012.” The phrase “prior to October 2012” should be removed from this sentence for clarity.

Response: Concur, text revised as requested.

7. Section 2.2 Summary of OU3 Previous Investigations, Page 2-3, T-51, No. 2 Sewage Treatment Plant, and UP-7: The document states, “Historic exceedances at the site that were not sampled during the RI include the following (locations-sic)...”. This statement is then followed by three paragraphs discussing why T-51, the No. 2 Sewage Treatment Plant, and UP-7 were not sampled during this RI. The Department requests further clarification as to previous investigations. The document should be revised to include a more detailed discussion on these and any other previous pre-RI sampling activities (referencing when they were conducted and by whom). The discussion on RI sampling should be moved forward into the RI sample discussion.

Response: Do Not Concur, historic sampling performed prior to the OU-3 RI is summarized in the *Technical Evaluation Memorandum for the Radiation Technology Superfund Site, Operable Unit 3*, (Tech Memo) dated December 3, 2012. A copy of this document has been provided to the NJDEP along with the Final Remedial Investigation Report, Operable Unit 3 (OU-3), for the Radiation Technology Inc. (RTI) Superfund Site. The format of the OU-3 RI report was agreed upon by the EPA team.

8. Section 2.2 Summary of OU3 Previous Investigations, Page 2-4, October 2012, January 2013, and March 2013: These subsections should be expanded to further detail the activities conducted during the site walk-throughs in October 2012, January and March 2013.

Response: Do Not Concur, the activities performed during the site walk-throughs are described as requested, how the information was used and where it is documented is also described.

9. Section 2.3.1 Concrete and Cinder Block Sampling, Page 2-5: This section should be revised to include a brief discussion on how the concrete and cinderblock wall sampling locations were selected (i.e. staining, painted surface, adjacent to equipment, height off the floor, etc.), referencing the buildings/structures that were included in this sampling program, and the analysis performed for each sample media. The document should clarify decontamination procedures for the equipment used to collect these samples.

Response: Do Not Concur, the sample selection process was agreed to by the EPA project team as appropriate, which was provided to the NJDEP in the *Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3* (Final dated April 18, 2013). The decontamination procedures for the equipment used to collect the samples is described in section 2.9 of the OU-3 RI report.

10. Section 2.3.2 Tank Contents Sampling, Page 2-6: This section should be revised to reference which buildings/structures contained tanks and cisterns that were sampled during this RI, referencing the analysis performed at each.

Response: Do Not Concur, the samples collected from each building/structure, the analyses performed, and the sampling methods are described in section 4 of the OU-3 RI report.

11. Section 2.3.2 Tank Contents Sampling, Magnetometer Survey, Page 2-6: The document should be revised to include a more detailed discussion of the magnetometer survey referencing the areal extent and depth of the area investigated. The Department also requests clarification as to whether the vent pipe was tracked to its endpoint.

Response: Concur, additional detail has been added to the magnetometer survey discussion as follows: “A magnetometer-assisted surface sweep was then completed in the approximately 20 foot by 20 foot area to trace the pipe and identify potential metallic objects on the surface and shallow subsurface”. The text clearly states that the endpoint of the vent pipe was not found.

12. Section 2.3.3 Soil Sampling, Page 2-6: This section should be revised to reference which buildings/structures were included in the soil sampling program, referencing the analysis performed. The document also notes that the stainless steel sampling equipment was disposed of after each use. Since the intent of sampling with stainless steel equipment is to save money and generate less waste; the Department questions why the equipment was disposed of after each use.

Response: Do Not Concur, The sampling and analyses performed at each building/structure are described in section 4 of the OU-3 RI report. The cost of all of the disposable equipment used for sample collection was less than the cost of a single equipment blank sample. Numerous equipment blanks would have been required for the OU-3 RI.

13. Section 2.3.4 Caulk Sampling, Page 2-7: This section should be revised to include a brief discussion on how the caulk sampling locations were selected (i.e. peeling caulk, etc.), referencing which buildings/structures were included in the sampling program and the analysis performed on each. See also comment above concerning the disposal of stainless steel sampling equipment.

Response: Do Not Concur, The sampling and analyses performed at each building/structure are described in section 4 of the OU-3 RI report. The cost of all of the disposable equipment used for sample collection was less than the cost of a single equipment blank sample. Numerous equipment blanks would have been required for the OU-3 RI.

14. Section 2.3.5 R-21 Former Drum Room, Page 2-7: The document states, “The floor drain pipe from R-21 was visually observed to have been cut in the grassy area and it pointed in the direction of the sewage treatment plant.” The document should be revised for clarity. In addition, since this section discusses activities associated with scoping of the floor drain, the third paragraph which references concrete and soil sampling should be moved elsewhere in the document.

Response: Concur, the document has been revised for clarity as follows: “It was also determined that the floor drain discharges into the grassy area located on the west side of the dirt road which is immediately adjacent to R-21 to the southwest. The floor drain pipe from R-21 was visually observed to have been cut in the grassy area, it was an open end of a cut pipe, and it pointed in the direction of the sewage treatment plant”. However, the text referencing activities, including sampling, has not been moved as requested.

15. Section 2.3.6 Potential Mercury Source Evaluation, Page 2-8: The document notes that 5 buildings contained overhead gas heaters that may have included mercury containing gas regulators. A detailed summary of the April 2013 investigations for buildings R-4, R-34 and R-47 was included in this RI. The document should be revised to include similar discussions for R-21 and R-51.

Response: Concur, the text has been revised to clarify buildings R-21 and R-51 do not have overhead gas heaters.

16. Section 2.3.7.1 Asbestos, Page 2-9: This Section references buildings and structures investigated as part of the Asbestos Containing Material (ACM) survey that are not referenced earlier in the document or included in Table 2-1, such as: the Old Water Tower, the Building Associated with the Old Water Tower, the Igniter Storage Building, and the Pump House 2. The document should be revised to include all buildings and structures under evaluation during this RI.

Response: Concur, Table 2-1 has been revised to indicate that additional buildings/structures were sampled during the asbestos and lead paint surveys performed, and that the information is included in sections 2.3.7.1 (asbestos) and 2.3.7.2 (lead paint), and Appendix B of the OU-3 RI report.

17. Section 2.3.7.2 Lead Based Paint, Page 2-9, 2nd paragraph: The sentence which starts with “A total of 424 XRF readings...” is confusing to the reader and should be revised for clarity.

Response: Concur, the text has been clarified as requested.

18. Section 2.3.7.2 Lead Based Paint, Page 2-10: This Section references buildings and structures investigated as part of the Lead Based Paint (LBP) survey that are not referenced earlier in the document or included in Table 2-1 such as: the Pump House 3, the Old Water Tower, the Building Associated with the Old Water Tower, the Igniter Storage Building, and R-43. The document should be revised to include all buildings under evaluation during this RI.

Response: Concur, Table 2-1 has been revised to indicate that additional buildings/structures were sampled during the asbestos and lead paint surveys performed, and that the information is included in sections 2.3.7.1 (asbestos) and 2.3.7.2 (lead paint), and Appendix B of the OU-3 RI report.

19. Section 2.3.9 Screening Level Assessment, Page 2-10: The discussion in Section 2.3.9 seems out of place, and may be better suited for inclusion in Section 5 as referenced.

Response: Do Not Concur, this section describes RI activities performed, which includes the screening level risk assessment performed.

20. Section 2.4.1 Sample Locations, Page 2-11: The document states, “The sample locations for previous investigations in the vicinity of OU3 are included in Figure 1-2.” The document should be revised to briefly discuss these samples referenced in Figure 1-2, as noted previously.

Response: Do Not Concur, Historic sampling performed prior to the OU-3 RI is summarized in the *Technical Evaluation Memorandum for the Radiation Technology Superfund Site, Operable Unit 3*, (Tech Memo) dated December 3, 2012. A copy of this document has been provided to the NJDEP along with the Final Remedial Investigation Report, Operable Unit 3 (OU-3), for the Radiation Technology Inc. (RTI) Superfund Site.

21. Section 2.4.1.2 P2 Area, Page 2-11: The document states, “A total of four buildings/structures were sampled in the P2 Area. Concrete, cinderblock, caulk and an oil sample were collected from this area.” The document previously referenced that ACM and paint samples were also collected in this area. This section should be revised to reference all samples collected and all buildings investigated in the P2 Area, noting the analytical parameters for each sample media.

Response: Concur, the section has been revised as requested.

22. Section 2.4.1.3 South Stand Area, Page 2-12: The document states, “A total of eight buildings /structures were sampled in the South Stand Area. Concrete, cinderblock, caulk and a water sample

were collected from this area.” As noted, ACM and paint samples were also collected in this area. This section should also be revised to reference all samples collected and all buildings investigated in the South Stand Area; noting the analytical parameters for each sample media.

Response: Concur, the section has been revised as requested.

23. Section 2.4.1.4 East Stand Area, Page 2-12: The document states, “A total of 12 buildings /structures were sampled in the East Stand Area. Concrete, cinderblock, caulk and water and soil samples were collected from this area.” As noted, ACM and paint samples were also collected in this area. This section should be revised to reference all samples collected and all buildings investigated in the East Stand Area; noting the analytical parameters for each sample media.

Response: Concur, the section has been revised as requested.

24. Section 2.7 Health and Safety Monitoring, Page 2-15: The document should be revised to reference the health and safety monitoring conducted as part of the ACM and LBP surveys.

Response: Concur, a statement regarding where the discussion of the health and safety monitoring conducted as part of the ACM and LBP surveys can be located has been added.

25. Figures 2-1 to 2-25: These figures should be revised to include all samples that were collected during this RI (including ACM and LBP samples) or a notation referencing where these additional sample locations can be found (i.e. document or figure).

Response: Concur, a notation referencing where the ACM and LBP sample locations can be found has been added.

26. Table 2-1 Sample Locations in OU3 - April 2013: This table should be divided into two distinct tables, such that the specific descriptive information for each building or structure is included in a stand-alone summary table as referenced above. The Sample Location Table should only include sample collection information, referencing the analysis performed for each sample or sample media. The table should also include the reason for selecting the concrete floor, cinderblock wall and caulk sample locations (i.e. staining or other features). The table should also include samples collected during the ACM and LBP surveys.

Response: Do Not Concur, the sampling information is provided is provided in section 4 of the RI report, and the sample selection process is described in the Tech Memo provided to the NJDEP along with the Final OU-3 RI report.

27. Section 3.1.1 Local Topography and Geology, Page 3-2: The document should include a generalized geologic map of the area.

Response: Do Not Concur, OU-3 consists of buildings/structures only. The geology and soils discussion provided in the report is appropriate for this project. Previous reports documenting the investigations of OU-1 (Groundwater) and OU-2 (Soil, Sediment, and Surface Water) investigated subsurface conditions.

28. Section 3.1.4 Soils, Page 3-5: The document should include a generalized soil map of the area.

Response: Do Not Concur, OU-3 consists of buildings/structures only. The geology and soils discussion provided in the report is appropriate for this project. Previous reports documenting the investigations of OU-1 (Groundwater) and OU-2 (Soil, Sediment, and Surface Water) investigated subsurface conditions.

29. Section 4.1.1 Screening, Page 4-1: The Department finds that the standards/criteria referenced in this Section, though consistent with the subsequent summary discussions, are not consistent with the standards/criteria referenced in Section 1.3. The Department acknowledges that soil, concrete and cinderblock samples should be compared to the Department's NRDCSRS and RDCSRS; however, the Department requests clarification on the comparison of caulk samples to these same standards. In addition, the document states, "The NJDEP remediation standards do not have a screening level for chromium." Please note, the Department's soil cleanup criteria for chromium can be found at the following website: http://www.nj.gov/dep/srp/guidance/rs/chrome_criteria.pdf. The Department also requests clarification on the use of the Department's Surface Water Quality Standards for all water samples in lieu of Department's GWQS. The document also states, "The oil samples were not compared to any standards..." However, further review of the document indicates that the oil samples were compared to the Department's soil RDCSRS and non-RDCSRS for lead and PCBs. Please clarify why oil samples were compared to the soil standards in lieu of those needed for proper disposal. Please also refer to the comments above concerning Section 1.3. The document should be revised accordingly.

Response: Concur, section 1.3 was revised for consistency. Do Not Concur, the OU-3 RI report states "The NJDEP remediation standards do not have a screening level for chromium. However, chromium III was used as a surrogate in the risk screening (Section 5)." NJDEP remediation standard is only available for hexavalent chromium. Do Not Concur, screening criteria for other media were agreed upon by the EPA team.

30. Sections 4.2 to 4.4 All Metals Summaries for Various AOCs and Sample Media: The Department finds the summary discussion of metals contaminant concentrations for various AOCs and sample media misleading. Though the document notes, "None of the metals had concentrations exceeding their respective standards." The document would then list several metals (i.e. aluminum, calcium, iron, magnesium, potassium and sodium, etc.) which do not have standards, and which are not typically evaluated unless they are a site-specific contaminant of concern (COC). The inclusion of these metals in the summary discussion is misleading, and suggests to the reader that they were detected at elevated concentrations that are a concern. The document should be revised to eliminate this misleading information, such that the list of metals that do not have a standard, and that are not typically evaluated unless they are a site-specific COC, which are not detected at concentrations above regional background levels, do not need to be included in the metals summary.

Response: Do Not Concur, the text clearly states that none of the metals had concentrations exceeding their respective screening standards and that metals were detected which do not have standards.

31. Sections 4.2 to 4.4 All Cinderblock and Concrete Sample Summary Discussions for Various AOCs: The Department finds the sample location discussion limited in site-specific information for each sample location; such that is unclear why these locations were selected. The document should be revised to include additional detail on why the cinderblock and concrete sample locations was selected referencing staining, cracks, painted on tiled surfaces, etc.

Response: Do Not Concur, the sample selection process was agreed to by the EPA project team as appropriate, which was provided to the NJDEP in the Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3 (Final dated April 18, 2013).

32. Section 4.2.4.2 R-34, Cinder Block Sample, Page 4-9: The document states, “One cinder block sample was collected...approximately 4 feet above the floor.” Whereas, Figure 4-3 notes the same sample was collected 3.5 feet above ground. The document should be revised to reflect the correct sample height for R34-CBK-01.

Response: Concur, revised as requested.

33. Section 4.2.4.3 R-34, Oil Sample, Page 4-10 and Table 4-4: The document previously stated that oil samples were collected for waste disposal characterization only. However this section, compares the oil sample (R34-OIL-01) analytical results to the Department’s soil RDCSRS and non-RDCSRS for lead and PCBs. Please clarify why the oil sample was compared to the Department’s soil standards and not EPA TSCA requirements for proper disposal.

Response: Concur, the text has been revised to state that the sample was collect for characterization purposes. Screening criteria has been agreed upon by the EPA team.

34. Section 4.3.2 S-46, Page 4-12: The document states, “Asbestos was observed on the floor in the west room.” The document should be revised to reference the type of asbestos found (i.e. tiles, shingles, insulation, etc.).

Response: Concur, The text has been revised to state “Overhead pipe insulation containing asbestos ...”.

35. Section 4.3.5.1 No. 1 Sewage Treatment Plant, Water Sample, SVOCs, Page 4-18: The document indicates that there are no “surface water screening standards” for butyl benzyl phthalate. Please note, the Department’s Surface Water Quality Standard (Fresh Water FW2) for butyl benzyl phthalate is 23 ug/l (aquatic-chronic) and 150 ug/l (human health).

Response: Butyl benzyl phthalate has a screening standard of 23 µg/L in the NJDEP Ecological Screening Criteria Table. The Ecological Screening Criteria was created from various sources to allow ease of reference for ecological screening criteria for surface water, sediment and soil. With the exception of the surface water quality standards (SWQS) (N.J.A.C. 7:9B), the ecological screening criteria are not promulgated standards, but are to be used as screening values in ecological assessments. Since the water samples have all been compared to the NJDEP SWQS, the butyl benzyl phthalate screening standard will not be used to maintain consistency in the report.

36. Section 4.3.5.2 No. 1 Sewage Treatment Plant, Sample Results Summary, Page 4-18 and Table 4-5: The document states, “The sample did not contain concentrations that exceeded their respective screening standards.” The Department reiterates that water samples should also be compared to the Department’s GWQS. See comment above concerning **Section 1.3** and **Section 4.1.1** for additional information.

Response: Do Not Concur, screening criteria used in the OU-3 RI report were agreed to by the EPA project team as appropriate, which was provided to the NJDEP in the Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3 (Final dated April 18, 2013).

37. Section 4.4.2.2 R-33, Soil Sample, Page 4-24: The document states, “Although the soil is not part of the OU3 investigation (not a building/structure), it was sampled due to a previous fire inside the building.” The Department notes this is the first notation in this document discussing the limited soil sampling program under this RI. The document should be revised to include a more

detailed discussion of the limited soil sampling program in Section 2.3.3 and other appropriate sections.

Response: Do Not Concur, section 2.3.3 describes the soil sample collection procedures followed in detail, and section 4 provides a more detailed discussion all soil samples collected.

38. Section 4.4.7 Test Stand 4 (R-4), Page 4-30: The document states, “The samples were collected in the cracks in the concrete, stained areas, and downgradient areas of the troughs.” Figures 2-19 and 4-8 should be revised to include the above-referenced troughs.

Response: Concur, Figures 2-19 and 4-8 have been revised to include the troughs.

39. Section 4.4.8.1 Cistern/Cistern Pump, Water Sample, Page 4-32 and Table 4-5: The Department reiterates that water samples should also be compared to the Department’s GWQS.

Response: Do Not Concur, screening criteria used in the OU-3 RI report were agreed to by the EPA project team as appropriate, which was provided to the NJDEP in the Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3 (Final dated April 18, 2013).

40. Section 4.4.10 Water Cooling Tower, Page 4-34: The document states, “The Water Cooling Tower contains standing water...” The document should be revised to discuss why this water was not sampled during this RI.

Response: Concur, the text has been revised to state that a water sample was not collect because no potential sources of contamination were associated with inside the building and that the water was clearly accumulated rain water which had entered through the open roof of the building.

41. Section 4.4.12 Water Tower, Page 4-36: The document should be revised to clarify the difference between the water tower and the water tank, referencing their design features (i.e. which one is on legs) and their respective heights. The document should clarify if the referenced heights are the total building heights include just the tank portion, as a review of aerial photographs suggests that the water tower (on legs?) is taller than the cylindrical water tank. The document should also clarify if either tanks are still in use for fire protection or as water supply source.

Response: Concur, the text has been clarified as requested.

42. Section 4.4.12.1 Water Tower, Water Sample, Page 4-36: The document states, “One water sample was collected from the AST...it was separated into two samples by the laboratory...” The document should be revised to further discuss the methodology behind “splitting the sample in two distinct samples, referencing the analytical suite selected for each.

Response: Concur, the method used for splitting the sample has been added to section 4.4.12.1. Analyses are already described in section 4.4.12.1.

43. Table 4-5: Summary of Detected Analytical Results for Water Samples: The Department reiterates that the water samples summarized in Table 4-5 should also be compared to the Department’s GWQS. In addition, please note, trichloroethene should be move from the SVOC list to the VOC list.

Response: Do Not Concur, see response to comment 3. Agree, trichloroethene has been moved from the SVOC list to the VOC list.

44. Section 5.2 Overview of the Hazardous Substances SLRA Results, Pages 5-29 to 5-31: This section references specific exceedances of EPA Screening Levels for removal management, industrial and residential use. Though the summaries reference the analyte exceeded they do not always specify the media (i.e. soil, caulk, concrete, cinderblock, etc.). The document should be revised to include the specific media where the exceedances were noted.

Response: Concur, text revised as requested.

45. Section 6.2.1.2 Paint Locker, Cinder Block Sample, Page 6-2: The document noted that PCBs were detected at 2 mg/kg in the Paint Locker cinderblock sample. The document should be revised to reference that PCBs were detected in the caulk sample at 2 mg/kg.

Response: Concur, text revised as requested.

46. Section 6.2.1.4 R-34, Oil Sample (Wall Mounted Transformer), Page 6-3: Please see comments concerning Section 4.2.4.3 regarding comparison of oil samples to appropriate standards.

Response: Do Not Concur, screening criteria used in the OU-3 RI report were agreed to by the EPA project team as appropriate, which was provided to the NJDEP in the Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3 (Final dated April 18, 2013).

47. Section 6.2.2.5, No. 1 Sewage Treatment Plant, Page 6-4: Please see comments concerning Sections 4.3.5.1 and 4.3.5.2 regarding comparison to appropriate standards.

Response: Do Not Concur, screening criteria used in the OU-3 RI report were agreed to by the EPA project team as appropriate, which was provided to the NJDEP in the Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3 (Final dated April 18, 2013).

48. Section 6.2.3.8 Cistern/Cistern Pump, Page 6-6: Please see comments concerning Section 4.4.8.1 regarding comparison to appropriate standards.

Response: Do Not Concur, screening criteria used in the OU-3 RI report were agreed to by the EPA project team as appropriate, which was provided to the NJDEP in the Project-Specific Quality Assurance Project plan for the Radiation technology, Inc. Superfund Site, Operable Unit 3 (Final dated April 18, 2013).

Please incorporate these comments into your correspondence concerning revisions to the Remedial Investigation Report for the OU3.

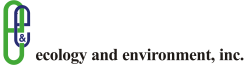
If you have any questions regarding this matter please contact Lynn Vogel, Case Manager at (609) 984-5311, or at lynn.vogel@dep.state.nj.us.

Sincerely:

Anthony Cinque, Supervisor
Bureau of Case Management

Cc: Lynn Vogel, Case Manager, NJDEP BCM
Kathleen Kunze, Technical Coordinator, NJDEP BEERA
Joseph Marchesani, Geologist, NJDEP BGWPA

R2-0001762



Completion of Independent Technical Review

Project: Radiation Technology Superfund Site, OU3
Deliverable: Final Remedial Investigation Report
Revision and Date: Final Rev. 0 - 12/9/13

Ecology and Environment, Inc. has completed the above reference deliverable. Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Contractor Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing USACE policy. The independent technical reviewers confirmed that all comments were responded to and the changes made in the document as stated. The independent technical review was accomplished by following signatories. All comments resulting from ITR have been resolved.

A handwritten signature in black ink, reading 'Robert A. Meyer'.

Date: 12/2/13

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Date: 12/5/13

Program Manager

As noted above, all concerns resulting from independent technical review of the project have been considered.

A handwritten signature in black ink, reading 'Marcia M. Galloway'.

Date: 12/5/13

Quality Control Manager

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List of Abbreviations and Acronyms

ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
AMSL	above mean sea level
AST	aboveground storage tank
ATK	Alliant Techsystems, Inc.
BGS	below ground surface
CLP	contract laboratory program
COPC	chemical of potential concern
CQCP	Contractor Quality Control Plan
CRA	Conestoga-Rovers & Associates
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DESA	Division of Environmental Science and Assessment
DRO/GRO	diesel range organics/gasoline range organics
E & E	Ecology and Environment, Inc.
EPA	(United States) Environmental Protection Agency
ERT	Environmental Response Team
FEMA	Federal Emergency Management Agency
FFS	Focused Feasibility Study
FSP	Field Sampling Plan
FW	fresh water
GPS	global positioning system
Hartgen	Hartgen Archeological Associates, Inc.
HASP	Health and Safety Plan
HWSB	Hazardous Waste Support Branch
HWSS	Hazardous Waste Support Section
IDL	instrument detection limit

List of Abbreviations and Acronyms (cont.)

IDW	investigation-derived waste
LBP	lead-based paint
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS/MSD	matrix spike/matrix spike duplicate
NHPA	National Historic Preservation Act of 1966, as amended
NJDEP	New Jersey Department of Environmental Protection
NJNHD	New Jersey Natural Heritage Database
Non-RDCSRS	NJDEP Non-Residential Direct Contact Health Based Screening Criteria and Soil Remediation Standards
NRHP	National Register of Historic Places
NTU	Nephelometric turbidity unit
OU	Operable Unit
PA	Preliminary Assessment
PACM	potentially asbestos-containing material
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
ppm	parts per million
PQL	practical quantitation limits
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QCSR	Quality Control Summary Report
RBSLs	Risk Based Screening Levels
RCRA	Resource Conservation and Recovery Act
RDCSRS	NJDEP Non-Residential Direct Contact Health Based Screening Criteria and Soil Remediation Standards
RI	Remedial Investigation
RTI	Radiation Technology Incorporated
SL	screening levels
SVOC	semi-volatile organic compound
TAL	Target Analyte List
THI	target hazard indices

List of Abbreviations and Acronyms (cont.)

TIC	tentatively identified compounds
TCL	Target Compound List
TCR	target cancer risks
Tech Memo	Technical Evaluation Memorandum
TSI	thermal system insulation
UFP	Uniform Federal Policy
USACE	United States Army Corps of Engineers, Kansas City District
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compound
XRF	X-Ray Fluorescent
YU	YU & Associates, Inc.

1

Introduction

The United States Army Corps of Engineers Kansas City District (USACE) worked with Ecology and Environment, Inc. (E & E) to prepare this Remedial Investigation (RI) report for the Radiation Technology Incorporated (RTI) Superfund Site, Operable Unit (OU) 3 located in the western portion of Morris County, New Jersey, at 108 Lake Denmark Road in Rockaway Township. The OU3 investigation area consists of 25 building/structures which are located in the P-2 Area (16 acres), East Stand Area (22 acres), and South Stand Area (27 acres) (see Figure 1-1).

RI activities included development of a Quality Assurance Project Plan (QAPP), Field Sampling Plan (FSP), Contractor Quality Control Plan (CQCP), and Health and Safety Plan (HASP). In addition, a cultural significance study and an asbestos and hazardous materials survey were also completed. RI fieldwork activities were conducted on April 22 through 26, 2013, and consisted of concrete, cinder block, caulk, soil, water, and tank contents/oil sampling; and asbestos and lead-based paint (LBP) sampling.

1.1 Purpose of Report

The primary purpose of this RI is to identify imminent threats in the OU3 area and determine what needs to be addressed prior to potential site re-use based on environmental sample analytical results of the following media:

- Concrete sample collection of the building/structure floors/walls;
- Cinder block sampling of the building/structure walls;
- Water samples from previously unsampled aboveground storage tanks (ASTs), sewage treatment plant, and cisterns;
- Caulk sample collection from doors/windows containing caulking on concrete;
- Oil sample collection from a wall mounted transformer;
- Soil sample collection and analysis of previously unsampled soil near key buildings/structures; and
- Collect potentially asbestos-containing materials (PACM) and/or LBP samples within designated buildings/structures.

This RI includes sample analytical results that were used to:

- Address data gaps to better understand the environmental condition of OU3;
- Complete general characterization of OU3; and
- Support the completion of a Focused Feasibility Study (FFS).

Data gaps in OU3 were determined in the Technical Evaluation Memorandum (Tech Memo) (E & E 2012) by USACE and United States Environmental Protection Agency (EPA) Region 2; a site walk conducted in October 2012 by E & E, USACE, YU & Associates, Inc. (YU), and Hartgen Archeological Associates, Inc. (Hartgen); and an additional site walk conducted in January 2013 by E & E and the EPA Region 2.

1.2 Site Description

The RTI site is located at 108 Lake Denmark Road, Rockaway Township, New Jersey (see Figure 1-1), near the small residential community of Lake Telemark, New Jersey, in the western portion of Morris County. The site area is a total of 263 acres (see Figure 1-2) and is divided into the following portions:

- East Stand Area (22 acres) – included in OU3;
- South Stand Area (27 acres) – included in OU3;
- P2 Area (16 acres) – included OU3;
- RTI Area (15 acres) – not included in OU3; and
- Undeveloped Land (183 acres) - not included in OU3.

The RTI area is not included in OU-3. The Undeveloped Land area consists of areas that have not been developed within the East Stand, South Stand, and P2 Areas (i.e., forested areas).

Initially, E & E's Tech Memo summarized the review 34 buildings/structures in OU3, which determined 26 of the 34 buildings needed additional sampling. However, one of those buildings/structures (Waste Disposal Area) was eliminated after further review, and a total of 25 buildings/structures remained to be sampled for the RI.

A cultural resource investigation was conducted by Hartgen for the RI and consisted of a National Register of Historic Places (NRHP)-eligibility evaluation of 36 structures and buildings plus five additional structures (e.g., guard house, water towers) within these areas but not technically within the survey. There are more structures included in the NRHP-eligibility evaluation than in the RI sampling activities because they all need to be evaluated for NRHP-eligibility, but not necessarily sampled for the RI (due to previous sampling activities or based on potential demolition or reuse purposes).

E & E's RI fieldwork includes areas only in OU3 (East Stand Area, South Stand Area, and P2 Area), including the 25 buildings/structures that were identified as requiring additional sampling in the Tech Memo (E & E 2012). The OU3 areas of the site are currently fenced off and posted to restrict public access. Most buildings/structures on-site are dilapidated or in poor condition, having been vacant since at least 2006.

Previous investigations were completed of the site groundwater (OU1) and potential groundwater contaminant sources (OU2) soils, sediment, and surface water). The reports documenting the investigation of the groundwater contaminant sources (OU2) surrounding the 25 building/structures comprising the (OU3) RI were reviewed during preparation of the Tech Memo in December 2012 (E & E 2012). However, further investigation of OUs 1 and 2 were not conducted as part of the OU3 RI fieldwork event.

The area around the Site is generally low-density residential in nature. However, there has been significant residential and industrial development in the region. To the west and southwest of the Site, significant heavy industrial activities have been ongoing at the Picatinny Military Arsenal facilities since the early 1990s (see Figure 1-1).

1.2.1 Site History

The site was owned by Singer Manufacturing Company prior to 1941 (Acres 1991). From 1941 to 1963, the site was owned by Reaction Motors, Inc. In 1947, Reaction Motors, Inc., began the construction of facilities to support rocket engine and component testing programs. From 1963 to 1972, Reaction Motors Division of Thiokol Chemical Corporation (Reaction Motors/Thiokol) owned the site. Past activities of Reaction Motors/Thiokol included conducting research and development testing of rocket engines and related components, rocket engine fill and load activities, and other relatively small-scale research and development programs of non-aerospace products. Propellant (ammonia, kerosene based JP fuel, and liquid oxygen) loading and partial assembly of rocket engines was also conducted. From 1972 to the present, the site was owned by RTI. Several of the buildings have been used as lawn equipment and automotive shops and storage by a landscape company (EPA 1994; Acres 1991). Currently, a company called Sterigenics is in operation on the RTI property (part of the 15 acres west of Lake Denmark Road), which is not included in the OU3 investigation. Sterigenics conducts sterilization of medical devices and food products.

1.3 Sample Analyses and Data Screening Process

Samples were collected from the P2 Area, South Stand Area, and East Stand Area for concrete, cinder block, and caulk samples; tank samples; water samples; and soil samples and were analyzed for the following:

- The concrete and cinder block samples were sampled and analyzed for semi-volatile organic compounds (SVOCs) using EPA Method 8270C; target analyte list (TAL) metals using EPA Methods 6010B and 7471A; PCBs using

EPA Method 8082; perchlorate using EPA Method 6850 and pesticides using EPA Method 8081A.

- Tanks containing liquid (ASTs/underground storage tanks [USTs]) were assumed to have contained fuel oil), at R-47, R-34, S-46, Test Stand 4, and Water Tower, (and the oil from the wall mounted transformer), therefore, they were sampled and analyzed for diesel range organic/gasoline range organics (DRO/GRO) using EPA Method 8015 and Lead using EPA Method 6010. In addition, the oil from the wall mounted transformer in R-34 will be analyzed for PCBs using EPA Method 8082. Due to the former industrial/commercial uses of the site, especially the use of rocket fuels and igniters, cisterns containing water and sludge at R-34, No. 1 Sewage Treatment Plant, S-49, and Cistern/Cistern Pump, were sampled and analyzed for VOCs using EPA Method 8260B; SVOCs using EPA Method 8270C; TAL metals using EPA Methods 6010B and 7471A; PCBs using EPA Method 8082; perchlorate using EPA Method 6850 and pesticides using EPA Method 8081A.
- Due to the former industrial/commercial uses of the site, especially the use of rocket fuels and igniters, the soil samples were sampled and analyzed for VOCs using EPA Method 8260B; SVOCs using EPA Method 8270C; TAL metals using EPA Methods 6010B and 7471A; and perchlorate using EPA Method 6850.
- Since it cannot be documented that all the doorways were installed at the same time and that no physical alterations were made since installation, samples were collected from multiple outer doorways (at the same building/structure) and composited into one sample. At a minimum, at least one 5-sample composite from different doorways shall be analyzed from each building's doorway caulking for PCBs using EPA Method 8082 and SVOCs using EPA Method 8270C. The same sampling procedure applies to the windows (NJDEP 2010).

The analytical results were screened against the screening criteria presented in the Uniform Federal Policy (UFP) QAPP (E & E 2013a) and are also discussed in Section 5.1.3. For screening purposes, concrete, cinder block, caulk, oil, and soil samples were compared with the May 7, 2012, NJDEP Residential Direct Contact Health Based Screening Criteria and Soil Remediation Standards (RDCSRS) and Non-RDCSRS. The RDCSRS are referred to in the NJDEP Solid and Hazardous Waste Management Program Guidance for Characterization of Concrete and Clean Material Certification for Recycling (NJDEP 2010). The Non-RDCSRS was also used for additional evaluation in case the RDCSRS were exceeded. The NJDEP remediation standards do not have a screening level for perchlorate. Therefore, the May 2013 EPA Regional Screening Levels for Soil (Residential and Industrial) for perchlorate were used. The NJDEP remediation standards do not have a screening level for chromium. However, chromium III was used as a surrogate in the risk screening (Section 5). The water samples were screened against the NJDEP Surface Water Quality Standards, Surface Water Quality for Toxic Substances (Fresh Water [FW2] Criteria). Section 4 summarizes analytical

results for the P2 Area, South Stand Area, and East Stand Area for concrete, cinder block, and caulk samples; tank samples; water samples; and soil samples.

In addition, risk based screening for hazardous substance concentrations found in the various bulk samples (concrete, cinder block and caulk) were compared with Risk-Based Screening Levels for Residential and Industrial Soil from EPA's Regional Screening Tables from May 2013 (EPA 2013a). Derivation of the screening levels is documented in EPA's Regional Screening Table User's Guide (May 2013) (EPA 2013b). Screening levels corresponding to target cancer risks (TCR) of 1E-6 and non-cancer target hazard indices (THI) of 0.1 and 1.0 were used. Contaminant concentrations also were compared with Removal Management Screening Levels (EPA 2012) corresponding to a TCR of 1E-4 and a THI of 3 for residential receptors. Removal management screening levels are considered when determining whether a removal action may be warranted. The removal management screening levels used were calculated from the residential soil screening levels given in the May 2013 Regional Screening Tables with suitable adjustments to TCR (1E-4) and THI (3.0). Risk based screening is described in Section 5.

1.4 Subcontracted Services

E & E subcontracted the completion of a cultural significance study for OU3 to Hartgen located in Rensselaer, New York. Hartgen has provided staff with the experience and credentials required for preparation of the cultural significance study. The cultural significance study included research conducted in house, no additional on-site work was required. A copy of their report is included as Appendix A.

E & E subcontracted the completion of an asbestos-containing material (ACM) and LBP survey for OU3 to YU located in Elmwood Park, New Jersey. YU provided staff with experience and credentials required for preparation of the asbestos-containing material and LBP survey. A copy of their Asbestos and Hazardous Materials Survey report is included in Appendix B.

E & E subcontracted Test America Denver located in Arvada, Colorado, to conduct analytical testing for perchlorate and oil samples. The EPA Region 2 used the contract laboratory program (CLP) system to conduct analytical testing for all routine organics and metals analyses.

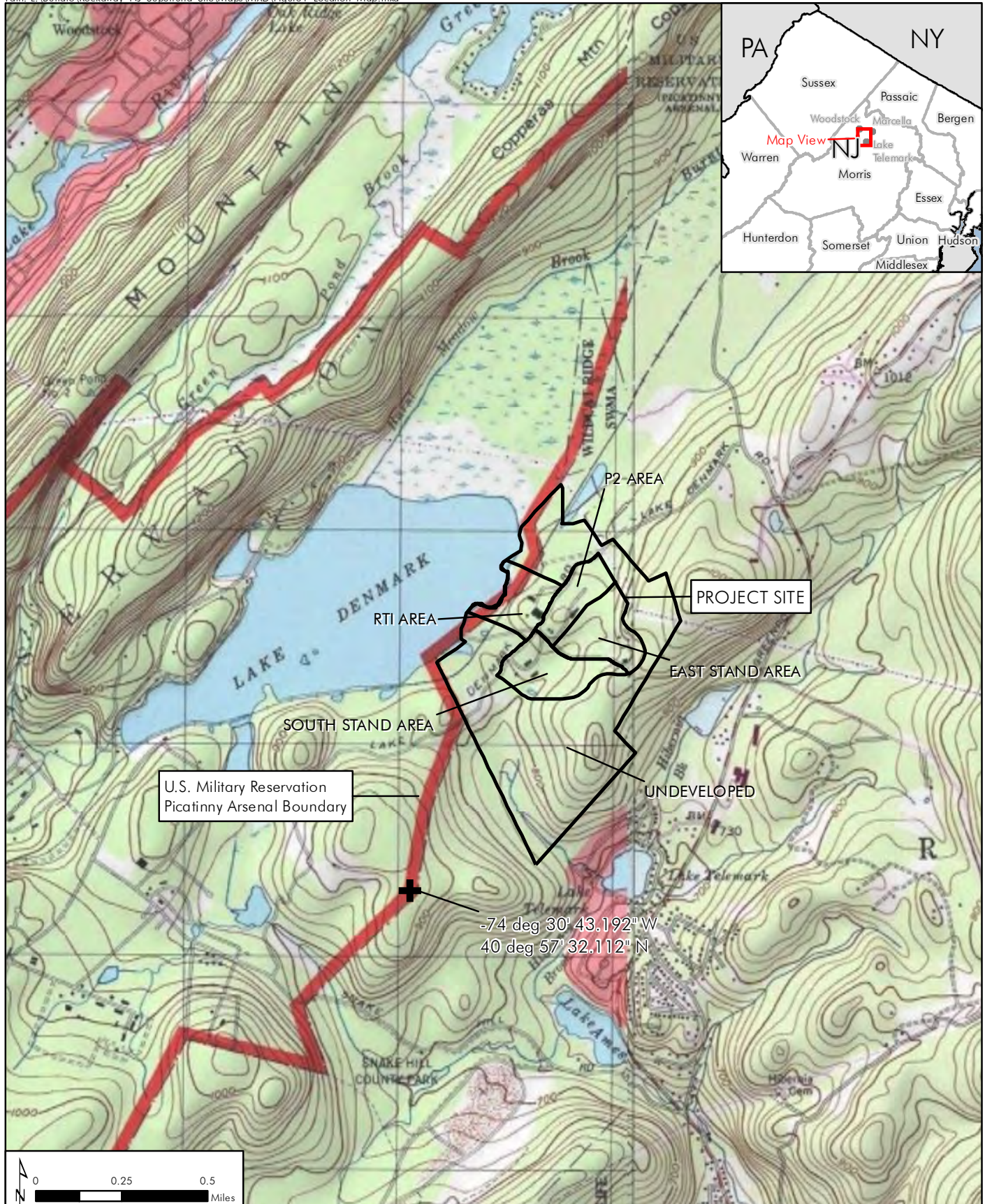
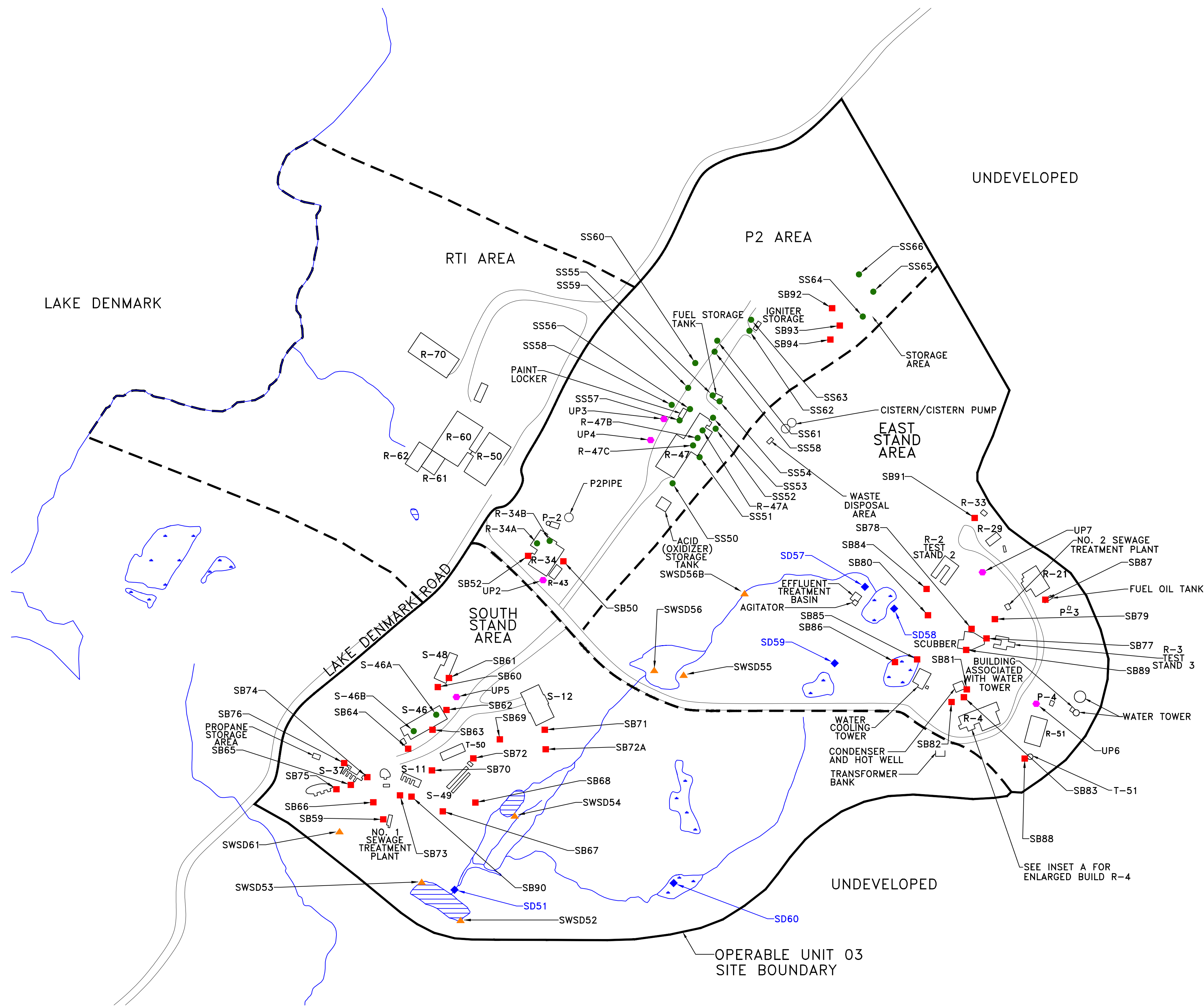
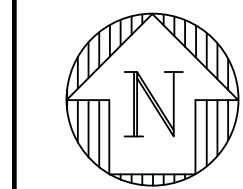


Figure 1-1

Site Location Map

Radiation Technology, Inc. Superfund Site
Rockaway Township, New Jersey

 Project Site



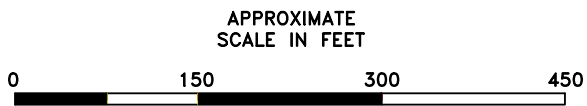
LEGEND

SB87 ●	SURFACE SOIL SAMPLE
SWSD56 ▲	SURFACE WATER & SEDIMENT SAMPLE
SB92 ■	SURFACE SOIL & SUBSURFACE SOIL SAMPLE
SD58 ◆	SEDIMENT SAMPLE
UP7 ●	SURFACE SOIL SAMPLE BENEATH A TRANSFORMER
	STREAM
	MARSHY AREA
	WATER BODY
	SITE AREA BOUNDARY

NOTE

1. AERIAL PHOTOGRAPHY FROM BING MAPS (2012 MICROSOFT CORPORATION)
2. R-47(A,B, & C) , S-46(A&B), AND R-34 SAMPLES ARE SUB-SLAB SAMPLES.

PREVIOUS SAMPLE LOCATIONS
SCALE: 1" = 150'



2

Remedial Investigation Activities

2.1 Summary of OU1 and OU2 Previous Investigations

Investigations related to the OU1 and OU2 areas have been conducted in all areas of the RTI property dating back to 1980. No investigations have been conducted for OU3 (buildings/structures) prior to E & E's RI fieldwork investigation. The following is a summary of the OU1 and OU2 previous investigations:

November 1980 to June 1981

The NJDEP and the Rockaway Township Health Department conducted various inspections of the site. The NJDEP also conducted investigations into the chemical types and quantities, waste disposal practices, and chemical waste characteristics associated with various production and manufacturing processes used at the site. Two principal on-site water supply wells were found to be contaminated with volatile organic compounds (VOCs) and were condemned by the Rockaway Township Health Department in June 1981 (CRA 2010).

August 1981

RTI was issued an Administrative Order and Notice of Prosecution by NJDEP, ordering RTI to properly remove and clean up all spills, buried wastes, and improperly stored waste materials (CRA 2010).

September 21, 1984

The RTI site was included on the National Priorities List due to elevated levels of VOCs present in the groundwater sampled from the site (CRA 2010).

1987 to 1992

The NJDEP and their subcontractor (Acres International Corporation) completed a multi-phased RI that included the installation and sampling of monitoring wells, sampling production wells, packer testing, and sampling of residential wells. Surface water and sediment samples were also collected from surface runoff drainage routes and Lake Denmark (CRA 2010).

1993

Thiokol Corporation (previous property owner) conducted a site inventory of containers (e.g., drums, tanks, sumps, and bottles) and conducted additional sampling. Concurrently, RTI conducted a hazardous substance interim remedial action that included sump cleaning; cleaning and removal of ASTs; excavation and removal of an UST; remediation of soils impacted with metals; the excavation

of four polychlorinated biphenyl (PCB)-impacted areas; and drum/container removal (CRA 2010).

2004

A Preliminary Assessment (PA) was conducted by Walsh Environmental Scientists and Engineers, LLC (under contract to Alliant Techsystems, Inc. [ATK]) for the undeveloped 184-acre parcel of land surrounding the site. The PA provided information concerning environmental conditions at the site, assessed the potential threat posed to human health and the environment, and determined the need for Comprehensive Environmental Response Compensation Liability Act/Superfund Amendments and Reauthorization Act activities. ATK and the EPA also investigated potential sources of groundwater contamination at the site. This investigation was limited based on historic operation related to the industry (e.g., storage, assembly, and testing of rocket motors) (CRA 2010).

2004 to 2005

The Pre-Remedial Design Investigation Report for OU1 describes the activities conducted by ATK to obtain a better understanding of current groundwater conditions and to confirm the viability of the groundwater remedy selected in the Record of Decision. The field program was conducted in two phases (2004-2005 and supplemental fieldwork in 2010-2011) and included groundwater sampling, well inspections, surveying, geophysical logging, monitored natural attenuation, and a Human Health Risk Assessment. The results of the 2005 draft Human Health Risk Assessment determined that cumulative cancer risks were within EPA's acceptable risk range for carcinogens (5×10^{-5}) and the cumulative non-cancer hazard index was less than EPA's target for site-related contaminants. The results of the updated 2011 Human Health Risk Assessment indicated the groundwater conditions at the Site have continued to improve significantly since the Record of Decision was issued (CRA 2011).

March and April 2005 (Environmental Response Team Sampling Report)

The EPA Region 2 and the EPA/Environmental Response Team (ERT) completed a multi-media sampling of paint chips, PACM, and soil. The investigations characterized lead and PACM contaminant levels within site buildings, assessed the likelihood of PCBs leaking from pole-mounted transformers, and assessed the possibility of asbestos particles adhering to objects scheduled for removal from site buildings (Lockheed Martin Technology Services/Environmental Services REAC 2005).

August – September 2006 (Phase 1A Cultural Resource Reconnaissance Report)

ATK commissioned a Phase IA Cultural Resource Reconnaissance Survey to identify archaeological and historic architectural sensitivities within the area of potential effects for groundwater remedial activities at the site. ATK hired CRA to complete the report (subcontracted Cultural Resource Consulting Group). No archaeological testing was conducted. Instead, a reconnaissance-level study was

completed to establish whether any previously identified archaeological and/or historic architectural resources existed with the area of potential effects for the site (CRCG 2007).

September – November 2008 (RI Report)

Conestoga-Rovers & Associates (CRA) conducted two phases of an RI for OU2 at the RTI Site for ATK. The RI activities were limited to investigating potential source(s) of groundwater impacts, including soil, sediment, and surface water. Furthermore, the investigation within these areas was focused on historic operations related to the rocket motor industry, such as the storage, assembly, and testing of rocket motors. The data collected during the OU2 investigation was intended to determine the remaining sources or groundwater impacts (if any), define the nature and extent of contamination, determine the background concentrations of select naturally occurring inorganics, and develop a Baseline Human Health Risk Assessment and Screening-Level Ecological Risk Assessment. The constituents of potential concern identified in the risk assessment included PAHs, metals, and VOCs (CRA 2010).

January – April 2010 (ERT Sampling Report)

The EPA Region 2 and the EPA/ERT completed sampling to generate site-specific contaminant data, including selected buildings for asbestos-containing material, LBP, and other contaminants and utility poles for PCBs (Lockheed Martin SERAS 2010).

2.2 Summary of Remedial Investigation Activities

Investigations related to OU3 (buildings/structures) have been conducted from October 2012 to the present. These investigations were located in the East Stand Area, South Stand Area, and P2 Area. No investigations were completed in the RTI Area for OU3.

Historic exceedances at the site that were not sampled during the RI include the following:

T-51

Previously contained sludge with metals and VOC concentrations that exceeded the screening standards (E & E 2012). During the site walk conducted by E & E, the tank was dry and no organic vapors were detected with a PID.

No. 2 Sewage Treatment Plant

Previously contained metals concentrations in the water exceeding the screening standards. The sludge contained concentrations of metals, VOCs, and pesticides exceeding the screening standards (E & E 2012).

UP-7

Transformer previously contained oil exceeding the screening standard. In 2012, the transformer was found lying on the ground and a small amount of oil was observed on the ground.

October 2012

A site walkover was completed for the East Stand Area, South Stand Area, and P2 Area by E & E, USACE, Hartgen, and YU. Each of the buildings/structures were measured, described, photographed, inventoried, and monitored (ambient air) for VOCs using a MiniRae PID. Each building/structure was also inspected for PACM and LBP. The results of the walkover were used to generate the Tech Memo (E & E 2012) and FSP (E & E 2013b).

January 2013

E & E and the USACE conducted an additional site walk-through to document building materials; black pipes (possible PACM), caulking, and light bulbs (possible mercury). These items were used to generate the FSP (E & E 2013b) for sampling and disposal purposes.

March 2013

E & E and USACE were on-site to document that the drums located in R-21 (East Stand Area) were removed by the U.S. EPA. The condition of the floor (e.g., cracks, location of the floor drain and thickness of concrete) was also documented. Based on these items, it was determined that additional sampling of the concrete (chips and soil) was necessary in the FSP (E & E 2013b).

2.3 April 2013 – OU3 RI Investigation

E & E and YU conducted a field investigation based on the FSP on April 22 through 26, 2013 (E & E 2013b). Sample locations for PACM and LBP are included in Appendix B. All other sample locations collected in OU3 are included in Table 2-1 and on Figures 2-1 through 2-25.

Variations from the FSP, including the number and locations of samples occurred as a result of unanticipated field conditions, or sampling locations that were moved to sample (e.g., in stained areas or cracks). If a sample was not collected in a planned location, the rationale for not collecting the sample is included on Table 2-1. USACE approved changes from the planned sampling during fieldwork. Additional changes to field activities are described in the QCSR in Appendix C.

Field activities were conducted by two E & E field teams consisting of a geologist and safety technician (Team 1), and an engineer and safety officer (Team 2); and by four YU personnel. The E & E site project manager was also on-site for the first four days. YU was subcontracted by E & E to conduct PACM and LBP sampling. A copy of their Asbestos and Hazardous Materials Survey report is summarized in Section 2.3.7 and included as Appendix B. E & E also subcontracted a cultural significance study to Hartgen (research was conducted in-house, no additional on-site work was required). The results of Hartgen's study are summarized in Section 2.3.8. A copy of the Hartgen report, entitled Data Summary Report: National Register Eligibility Evaluation of the Radiation Technology OU3 Superfund Site, 108 Lake Denmark Road, Rockaway Township,

2 Remedial Investigation Activities

Morris County, New York, is included as Appendix A. Two additional E & E personnel were on-site on April 24, 2013, to conduct a Quality Assurance and Health and Safety Audit. A copy of the audit is included in the Quality Control Summary Report (QCSR) (see Appendix C). A USACE representative also conducted a Field Audit on April 25, 2013, not included in this report.

During the field effort, sampling activities were conducted for concrete, cinder block, caulking, soil, tank contents/oil, PACM, and LBP. Results of the field effort are included in Section 4. The methodologies of each activity are described in Sections 2.3.1 through 2.3.6. Photographs were taken before and after each sample was collected and of various site features. A photographic log of the activities and selected sampling locations is presented in Appendix D.

2.3.1 Concrete and Cinder Block Sampling

The concrete and cinder block samples were collected by removing material from the surface to a depth of 1-inch (in a 1-square-foot area) of the concrete/cinder block using a chisel bit and hammer drill until enough material was collected for the sample. The work plan stated that a coring drill bit would be used to drill the sample and the chips collected; however, the coring drill bit was not able to penetrate the concrete sufficiently to provide the volume required for sample analysis. The change was approved by the USACE on April 23, 2013, as noted in E & E's field logbook.

A portable generator and extension cords were used to power the drill. The concrete/cinder block sample was transferred to aluminum foil and placed inside plastic baggies (no containers were used per the laboratories instructions). A photograph was taken of the sample location before and after sampling.

The concrete and cinder block samples were sampled and analyzed for SVOCs using EPA Method 8270C; TAL metals using EPA Methods 6010B and 7471A; PCBs using EPA Method 8082; perchlorate using EPA Method 6850 and pesticides using EPA Method 8081A.

2.3.2 Tank Contents Sampling

Tanks and cisterns were sampled using a combination of disposable polyethylene bailers and a sludge sampler (Sludge Judge plastic samplers). The equipment needed to sample using a disposable bailer included nylon line, a sharp knife, and plastic sheeting. The plastic sheeting was placed underneath or near the sample location to prevent contact of the bailer or line with the ground. The line was attached to the bailer, and was slowly lowered until it was submerged. The bailer was pulled out of the tank or cistern; ensuring that the line either fell onto the plastic sheeting or never touched the ground. While wearing nitrile gloves, the contents were slowly poured from the bailer into the laboratory-provided sample containers. A 5-gallon bucket was placed beneath the bailer and sampling containers to catch any spills while sampling. Any spillage captured in the 5-gallon bucket was placed back into the tank/cistern from which the sample was collected.

The Sludge Judge sampler was used when a dip sampler or disposable bailer could not be used. The Sludge Judge sampler is a clear tube with markings at 1-inch increments providing an accurate visual cross-section sample. The sampler was lowered into the tank to open the float valve and allowed the material to flow inside. When the bottom of a tank was reached, the sampler was pulled up to close the valve and retained the material. The Sludge Judge is constructed of polyethylene and was decontaminated between samples using a spiral cleaning brush, deionized water, and AlconoxTM in accordance with the FSP (E & E 2013b).

Field measured water quality parameters (temperature, pH, conductivity, and turbidity) were measured from the samples collected from the tanks and cisterns (water samples only) as a grab sample using the Myron 6P Water Quality Meter. Table 2-2 includes water parameters collected during water sampling activities. Nephelometric turbidity units (NTUs) were measured using a LaMotte 2020 Portable Turbidity Meter. The sample containers were filled first, then water quality parameters and turbidity were measured. The meters were calibrated prior to starting work. Calibration was conducted in accordance with the instruments' manufacturer recommendations by following the calibration procedures specified in the instruction manual. The completed calibration forms are included in the QCSR (see Appendix C).

Prior to sampling, a measuring rod was slowly placed inside the tank/cistern to determine the depth to liquid and if sludge was present. No sludge was found in any of the tanks/cisterns; therefore, no sludge samples were collected.

Tanks containing liquid (ASTs/USTs were assumed to have contained fuel oil), at R-47, R-34, S-46, Test Stand 4, and Water Tower, (and the oil from the wall mounted transformer), therefore, they were sampled and analyzed for DRO/GRO using EPA Method 8015 and Lead using EPA Method 6010 in addition, the oil from the wall mounted transformer in R-34 will be analyzed for PCBs using EPA Method 8082. Due to the former industrial/commercial uses of the site, especially the use of rocket fuels and igniters, cisterns containing water and sludge at R-34, No. 1 Sewage Treatment Plant, S-49, and Cistern/Cistern Pump, were sampled and analyzed for VOCs using EPA Method 8260B; SVOCs using EPA Method 8270C; TAL metals using EPA Methods 6010B and 7471A; PCBs using EPA Method 8082; perchlorate using EPA Method 6850; and pesticides using EPA Method 8081A.

Magnetometer Survey

Prior to working at the R-47 area, all brush and tall grasses were cleared within a 3-foot radius of the possible UST location. A 2-inch steel vent pipe was observed extending 6 feet from the corner of the outside of the former boiler room (south side of the building). The soil beneath this vent pipe was removed 2 feet deep and it appeared the pipe extended beyond this depth. It appears the vent pipe may have been used for a tank formerly located in the building to fuel the boiler. A

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magnetometer-assisted surface sweep was then completed in the approximately 20-foot by 20-foot area to trace the pipe and identify potential metallic objects on the surface and shallow subsurface. A handheld magnetometer (model GA-52Cx by Schonstedt Instrument Company) was used along with hand digging to determine the presence or absence of a UST. No UST was located at the R-47 area.

2.3.3 Soil Sampling

Soil samples were collected using a dedicated hand trowel, stainless-steel spoon, stainless-steel bowl, and the sampling equipment provided by the laboratory for VOC collection (En Core™). The area to be sampled was cleared of surface debris (e.g., twigs, rocks, and litter). The samples were collected at a depth of 0 to 6 inches below ground surface (BGS) with a dedicated stainless-steel hand trowel. The hand-collected samples were emptied into a pre-cleaned stainless-steel bowl and homogenized. The sample was then transferred to appropriate sample containers. Any unused soil was returned to the sample location and placed back in the hole. The dedicated hand trowel, stainless-steel spoon/bowl were disposed of after sample collection as investigation-derived waste (IDW). The portion of the soil sample for VOC analyses was not from the composite mixture, but was extracted directly from the ground surface in accordance with EPA procedures using a coring device (En Core™). A photograph was taken of the sample location before and after sampling.

Due to the former industrial/commercial uses of the site, especially the use of rocket fuels and igniters, the soil samples were sampled and analyzed for VOCs using EPA Method 8260B; SVOCs using EPA Method 8270C; TAL metals using EPA Methods 6010B and 7471A; and perchlorate using EPA Method 6850.

2.3.4 Caulk Sampling

Caulking around the doors and windows was generally removed by hand while wearing a nitrile glove. In areas where caulking that could not be easily removed by hand was sampled, a disposable stainless-steel spoon or knife was used to loosen the caulking. Once the caulking was removed, it was wrapped in aluminum foil and placed into a plastic baggie. No containers were used per the laboratory's instructions. The stainless-steel spoon(s) were discarded as IDW after use. A photograph was taken of the sample location before and after sampling.

Since it cannot be documented that all the doorways were installed at the same time and that no physical alterations were made since installation, samples were collected from multiple outer doorways (at the same building/structure) and composited into one sample. At a minimum, at least one five-sample composite from different doorways shall be analyzed from each building's doorway caulking for PCBs using EPA Method 8082 and SVOCs using EPA Method 8270C. The same sampling procedure applies to the windows (NJDEP 2010).

2.3.5 R-21 Former Drum Room

Building R-21 is located in the East Stand Area of the site. The former drum room in R-21 (15 feet 2 inches by 15 feet 8 inches) is constructed of concrete, cinder block, and caulk, and contains wood studs with some drywall inner walls. It is located in the south corner of the R-21 building (see Figures 2-16 and 2-16a). During the October 2012 site walk, miscellaneous debris including approximately 30 drums/containers (55-, 30- and 5-gallon) were observed in this room. Prior to the April 2013 RI sampling event, the EPA removed the debris and drums under their spill response program.

During the April 2013 fieldwork, it was observed that the floor drain (5.5-inch diameter cover) located on the east side of the room was not working. The pitch of the floor was determined to be flowing towards the floor drain using a 4-foot level (see Figures 2-16 and 2-16a). An attempt was made to clear the drain of debris using an electronic powered plumbing snake. The plumbing snake reached 18 inches into the drain with 4 inches of sediment present. The sediment was not sampled because it could not be reached. After numerous attempts, the plumbing snake could not reach beyond 18 inches due to a bend or plug in the 2-inch pipe, therefore, the drain could not be cleared. It was also determined that the floor drain discharges into the grassy area located on the west side of the dirt road which is immediately adjacent to R-21 to the southwest. The floor drain pipe from R-21 was visually observed in the grassy area, it was an open end of a cut pipe, and it pointed in the direction of the sewage treatment plant.

Two concrete chip samples were collected from a depth of 0 to 1 inch with a hammer drill and chisel in the 6-inch-thick concrete. Samples were taken from the center of the room (in a stained area of concrete) (R21-CON-02) and adjacent to the drain (R21-CON-03). The floor was scraped clean of tile residue before sampling 0 to 1-inch deep. One soil sample (R21-SOIL-01 and duplicate sample R21-SOIL-R1) was collected beneath R21-CON-02. The concrete was patched using Quikcrete™ concrete mix. Figures 2-16 and 2-16a include the sample locations for R-21.

2.3.6 Potential Mercury Source Evaluation

Buildings constructed prior to 1961 may have mercury-containing components associated with heating equipment, such as gas pressure regulators, boiler heating systems, and mercury switches in thermostats. A mercury spill occurring during improper removal of these devices poses significant health risks and could result in costly remediation. Exposure to released mercury is hazardous to human health and the environment since it volatilizes at ambient temperatures into an invisible, odorless, and toxic vapor. Inhalation of mercury vapors can cause irreversible damage to the brain and kidneys, as well as harm the central nervous system, respiratory system, and developmental processes. Mercury can also enter the body through contact with the skin (absorption) or by swallowing (ingestion), although these two exposure routes are considered less harmful than inhalation (USEPA 2008). Management practices for mercury-containing equipment are defined in the Federal Universal Waste Rule (40 CFR Part 273).

As part of the field investigation work, E & E assessed the existing buildings to identify devices that have the potential to contain mercury. All of the buildings were checked for potential mercury containing devices in January 2013 during the site reconnaissance walk through which was used to identify areas where additional sampling would be necessary to address identified data gaps at the site. All of the thermostats encountered at that time were identified as utilizing bimetal coils and not mercury switches for their operation. Buildings that had the potential for mercury containing gas regulators associated with the overhead natural gas heaters were visually assessed in more detail as part of the April 2013 field investigation. The buildings identified with overhead heaters during the site reconnaissance walkthrough included R-4, R-34, and R-47. No mercury containing devices were identified in any of the buildings during the field investigation.

A summary of observations is detailed below:

- Building R-4: in the East Stand Area contained eight overhead gas unit heaters. Four heaters were located in the main test room, three heaters were observed in each of the three smaller test rooms, and the eighth unit was located in an office area located along the southeast corner of the building. Based on the configuration of the piping and the infrastructure evaluated, as shown in Appendix D/R-4, it does not appear that there is a mercury-containing gas regulator associated with any of the heaters in Building R-4.
- Building R-34: contained four overhead gas unit heaters. One of the heaters had been removed from the ceiling and was located on the floor in the center of the room (see Appendix D/R-34). The piping observed for these heaters did have an inline gas pressure regulator; however, it did not appear to contain mercury (see Appendix D/R-34).
- Building R-47: contained seven overhead gas unit heaters located throughout the building. Based upon the configuration of the piping and infrastructure evaluated, as shown in Appendix D/R-47, mercury-containing gas regulators are not associated with any of the heaters.

2.3.7 Asbestos and Lead Based Paint Survey

YU was subcontracted by E & E to conduct a hazardous materials investigation to identify the types and locations of ACM and LBP in OU3. The investigation consisted of review and assessment of previous hazardous materials investigation results at the site, a site reconnaissance conducted in October 2012, and a pre-demolition hazardous materials investigation of 35 buildings located in OU3 conducted in April 2013 simultaneously with the RI fieldwork performed by E & E. The conclusions of the pre-demolition Asbestos and Hazardous Materials Survey Report are summarized below and also included in Appendix B.

2.3.7.1 Asbestos

ACM (thermal system insulation and/or miscellaneous) was identified in 15 buildings/structures in OU3:

- Seven from East Stand Area (R-29, R-21, Old Water Tower, Building Associated with the Old Water Tower, R-51, R-4, and Water Cooling Tower);
- Four from South Stand Area (S-12, S-46, S-11, and S-37); and
- Four from P2 Area (R-47, Igniter Storage Building, Pump House 2, and R-34).

A total of 98 bulk samples were collected and 44 ACMs were confirmed through laboratory results to contain concentrations of asbestos ranging from 2% to 32%. In addition, two materials were assumed ACM due to inaccessibility or safety reasons (boiler gaskets in R-47 and unsound roof on R-47). The condition of the ACMs was identified as poor and friable. Asbestos abatement under applicable federal, state, and local regulations will be required prior to demolition/renovation work of all buildings/structures to ensure no asbestos fibers are released into the air (see Appendix B).

2.3.7.2 Lead-Based Paint

The LBP inspection was performed by Sky Environmental (sub-contracted by YU) using an INNOV-X Model I-3000 X-Ray Spectrum Analyzer, X-ray fluorescent (XRF) apparatus to screen painted surfaces, in conjunction with collection and analysis of paint chip samples (performed by YU) to check the XRF method for consistency with the traditionally used Atomic Absorption Method.

A total of 424 XRF readings and the appropriate calibrations were collected in the 21 identified buildings/structures with suspect painted components. Based on these readings, a total of 14 buildings/structures were determined to not have any painted components. A total of 36 paint chips were collected and sent for analyses and 19 paint chips contained LBP.

LBP was identified by XRF screening as being present in the following locations:

- East Stand Area (Pump House 3, R-3, the Old Water Tower, the Building Associated with the Old Water Tower, and R-4);
- South Stand Area (S-46); and
- P2 Area (R-47, Paint Locker, Igniter Storage, R-43, and R-34).

LBP was identified by paint chip sampling and analysis as being present within the following locations:

- East Stand Area (R-2, R-33, the Old Water Tower, the Building Associated with the Water Tower, R-3, R-21, and R-4);

- South Stand Area (S-46); and
- P2 Area (R-47, Paint Locker, Igniter Storage, R-43, and R-34).

Generally, the condition of paints was found to be poor (see Appendix B).

2.3.8 National Register Eligibility Evaluation of Structures and Buildings

Hartgen conducted a NRHP eligibility evaluation of 36 structures and buildings at the site (see Appendix A). Excluded from the present survey were additional minor structures and landscape features which were not subject to remediation. Five additional structures within these areas but not technically within the survey, were examined during the site visit and were considered when developing these recommendations. Based on the results of the NRHP eligibility evaluation study, Hartgen concluded that none of the structures and buildings included in the RI are recommended as individually eligible for inclusion in the NRHP. However, Hartgen has recommended that these structures and buildings collectively represent contributing elements of a single NRHP-eligible historic district. Hartgen has referred to this potential historic district as the Reaction Motors Lake Denmark Historic District, and has defined the historic district as the area that is contiguous with the boundaries of the RTI property (see Appendix A). The results of the NRHP eligibility evaluation are discussed in greater detail in Section 3.1.7 and Appendix B.

2.3.9 Screening Level Risk Assessment

A screening level risk assessment (see Section 5) was completed for concrete, cinder block, caulk, soil, water, and oil samples collected as described in Section 2.3. These samples were analyzed for hazardous substances including metals, SVOCs, pesticides, perchlorate, VOCs, and PCBs. Generally these samples are bulk materials consisting of pulverized chips or intact pieces (caulk) of these materials. In situ, these are solid, consolidated materials, only the surfaces of which would be available for direct contact by human receptors that might enter or use the site for various purposes. These bulk samples are not materials that might adhere to receptor's skin or which receptors might inadvertently ingest as a result of hand-to-mouth contact, or which might become airborne, as a result of either volatile or particulate emissions, where they might be inhaled. These bulk samples do not realistically represent exposure media to which potential receptors might be exposed in the ways they might be exposed to soil or water, therefore they cannot be used to derive meaningful exposure point concentrations for the intact structures from which base line risk estimates, reflecting existing conditions, could be derived. The available samples provide reasonable estimates of exposure point concentrations that might be encountered in the future if the buildings and structures were demolished, broken up, and the debris left on site.

Because of these data limitations, only a screening level risk assessment reflecting potential future risks was possible. In addition, the migration of contaminant compounds and elements, chemical persistence, and behavioral characteristics of those compounds and elements could not be determined. Therefore, a fate and

transport discussion could not be completed. Per the August 12, 1993, EPA Office of Solid Waste and Emergency Response letter: “A discharge of a hazardous substance, pollutant or contaminant that remains contained within a building is not a release under CERCLA unless it subsequently enters into the environment. It may be a threatened release and, thus, subject to CERCLA response authority (50 FR 13462, April 4, 1985).” Since the OU3 investigation did not extend beyond the buildings/structures, a fate and transport section was not completed due to incomplete pathways, the nature of the media (concrete, cinder block, caulk), and the potential routes of migration was not investigated. The screening level risk assessment is discussed in Section 5.

2.4 Sample Location Selection

This section describes the rationale for selecting the sample locations. The sample data was also used to determine if contamination was present and the contaminant concentrations in the previously un-sampled ASTs, sewage treatment plant, cisterns, wall mounted transformer, PACM, and potential LBP. The PACM and LBP survey was conducted per Sections 2.3.7.1 and 2.3.7.2, and the sample locations and sample results are included in Appendix B. Factors considered when selecting the sample locations included the locations of areas sampled during previous investigations and previous sample results (in OU1 and OU2), the former use of a particular building/structure, the ability to access the proposed sampling locations safely, and the likelihood that the sample locations would provide information that would support the general characterization of the materials and buildings/structures sampled.

2.4.1 Sample Locations

Sample locations were selected on the basis of the criteria describe above. The sample locations from previous investigations in the vicinity of OU3 are included on Figure 1-2. Table 2-1 provides a summary of the sample locations. Figures 2-1 through 2-25 include the sample locations for each building/structure. PACM and LBP sample locations are included in Appendix B. The horizontal locations of select samples were surveyed by E & E using a global positioning system (GPS), Trimble XT with sub-meter accuracy. E & E used a tape measure for locations without GPS reception (e.g., inside site buildings).

2.4.1.1 P2 Area

A total of four buildings/structures (R-47, Paint Locker, Acid [Oxidizer] Storage Tank, and R-34) were sampled in the P2 Area. Concrete, cinder block, caulk, and an oil sample were collected from this area. The oil sample was collected from a wall mounted transformer using disposable equipment (pipette) and nitrile gloves. Samples collected from each of these buildings/structures are described in Table 2-1. PACM and LBP samples collected in the P2 Area are included in Appendix B.

2.4.1.2 South Stand Area

A total of eight buildings/structures (Test Stand 12 [S-12], S-46, Test Stand 11 [S-11], Test Stand 37 [S-37], No. 1 Sewage Treatment Plant, S-48, T-50, and

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S-49) were sampled in the South Stand Area. Concrete, cinder block, caulk, and a water sample were collected from this area. Samples collected from each of these buildings/structures are described in Table 2-1. PACM and LBP samples collected in the South Stand Area are included in Appendix B.

2.4.1.3 East Stand Area

A total of 12 buildings/structures (Test Stand 2 [R-2], R-33, R-29, R-21, Test Stand 3 [R-3], R-51, Test Stand 4 [R-4], Cistern/Cistern Pump, Water Cooling Tower, Condenser and Hotwell, Water Tower AST, and Agitator and Effluent Treatment Basin) were sampled in the East Stand Area. Concrete, cinder block, caulk, water, and soil samples were collected from this area. Samples collected from each of these buildings/structures are described in Table 2-1. PACM and LBP samples collected in the East Stand Area are included in Appendix B.

The water tower AST contents were sampled but the actual water tower in the East Stand Area was not part of this investigation (see Figure 1-2). Due to the proximity of the water tower to a walking path, it is recommended that a structural integrity analysis of the water tower be conducted to ensure that the tower is safe.

2.5 Field Quality Control Samples

Quality control samples, including rinsate blanks, duplicate samples, and matrix spike/spike duplicates (MS/MSD) were collected as designated in the UFP QAPP (E & E 2013a). The rinsate blanks were collected from non-disposable sampler equipment using deionized water during the fieldwork event to verify the sampling devices were clean during sample collection. The rinsate blanks were collected from drill bits used to drill the concrete and cinder block samples (one drill bit used by Team 1 and two drill bits used by Team 2). Rinsates were not analyzed for perchlorate analysis because the bottles were insufficient. A trip blank was shipped to the laboratory with the one set of water samples that were analyzed for VOCs.

Field duplicate samples were collected at a frequency of 1:10 field samples and MS/MSD were collected at a frequency of 1:20 field samples.

The QCSR in Appendix C provides a description of the field QC samples and the sample associations as well as a summary of the results.

As stated in Section 3 of the QCSR (Appendix C), the appropriate qualifiers were added to the data to indicate potential concerns with data usability. These qualifiers were transferred to the data presented on tables in Section 4. The following qualifiers were added:

- J = This qualifier indicates an estimated value because the associated QC data indicated a potential laboratory or matrix problem or interference. In addition, J flags assigned by the laboratory to chemical data indicate

the results are below the practical quantitation limits (PQL) but above the instrument detection limit (IDL) or method detection limit (MDL).

- R = The positive results were rejected because of serious deficiencies in the ability to analyze the sample. The presence or absence of the analyte cannot be verified.
- U = The result is considered non-detect. The laboratory assigned this flag to analytes not present at detectable concentrations (above the IDL or MDL). The data validator assigned this flag when an analyte was considered nondetect as a result of blank contamination. If the result is above the PQL, the PQL is considered elevated.
- UJ = The non-detect value is considered estimated.
- UR = The non-detect results were rejected because of serious deficiencies in the ability to analyze the sample. The presence or absence of the analyte cannot be verified.
- NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- D = The reported value is from a dilution.
- M = Manual integrated compound.

2.6 Sample Packaging, Shipping, and Custody

2.6.1 Sample Packaging and Shipping

The samples were placed in a cooler with ice (contained in double zip-locked bags) following collection and then maintained at 4°C, including during shipment to the laboratory.

Sample containers and samples wrapped in aluminum foil were placed inside sealed plastic bags as a precaution against cross-contamination caused by leakage or breakage. They were placed in coolers in such a manner as to eliminate the chance of breakage during shipment (i.e., bubble wrap). Each cooler was designated in the "number of total number" format (e.g., 1 of 2, 2 of 2).

Sample shipment was performed in accordance with all applicable United States Department of Transportation regulations. The samples were shipped to either Test America or an EPA CLP analytical laboratory (A4 Scientific in Woodlands, Texas) by an overnight service. Arrangements were made with the laboratory point of contact for samples that were delivered so that holding times were not compromised.

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- Test America Denver – Perchlorate sample analyses for most samples, and DRO/GRO, PCBs and lead for oil and tank samples.
4955 Yarrow St.
Arvada, CO 80002
Point of Contact: Mr. Pat McEntee
Phone: (303) 736-0112
- EPA CLP - All sample analyses except Perchlorate and oil/tank samples.
EPA - Region 2
Hazardous Waste Support Branch (HWSB) – Hazardous Waste Support Section (HWSS)
Point of Contact: Mr. Michael Adly
Phone: (732) 906-6161

2.6.2 Sample Custody

In order to demonstrate that the samples and coolers were not tampered with during shipment, adhesive custody seals were used. The custody seals were placed across the cooler lids in such a manner that they could be visibly disturbed upon opening of the cooler. The seals were initialed and dated by field personnel when affixed to the cooler.

Documentation of the chain-of-custody of the samples was necessary to demonstrate that the integrity of the samples was not compromised between collection and delivery to the laboratory. All information requested in the chain-of-custody record was completed. One copy of the chain-of-custody form was retained by the sampler and placed in the project records file. The remaining pages were sealed in a plastic bag and placed inside of the cooler. Upon receipt at the laboratory, the chain-of-custody forms were completed. It was the responsibility of the laboratory to document the condition of custody seals and sample integrity upon receipt.

2.7 Health and Safety Monitoring

During fieldwork activities, organic vapor monitoring was conducted with a MiniRae 2000 PID using an 11.7-electron volt lamp on a continuous basis during active sampling activities. The PID measured ambient air near each of the sampling locations and was recorded in a fieldbook. The highest PID reading (5.8 part per million [ppm]) was from inside the dry AST at S-46. All remaining PID readings collected during the field investigation in OU3 were below 5 ppm. All PID readings collected inside buildings were also below 5 ppm.

A fiber count in air test was conducted by YU during the site reconnaissance in October 2012. Based on results from this test, YU determined that no special PPE equipment would be needed during asbestos and LBP work except when taking samples of friable ACM. For ACM sampling, half-face respirators and Tyvek™ suits were used for adequate protection (see Appendix B).

2.8 Investigation-Derived Waste

IDW (Resource Conservation and Recovery Act [RCRA] non-hazardous), including personal protective equipment, paper towels, spoons, and disposable equipment generated during the sampling event was double bagged and disposed of as municipal trash.

Soil/cinder block/concrete remaining from sample collection were spread near (or placed back into) each respective sample location.

2.9 Equipment Decontamination

Non-disposable sampling devices were decontaminated on-site by removing visible sediment (scraping and/or brushing it off), washing with non-phosphate detergent (Alconox™) in tap water, rinsing it with tap water, and then rinsing it with de-ionized water and allowing to air dry per the FSP (E & E 2013b). The equipment was then wrapped in aluminum foil if it was not used immediately. All decontamination water was stored in 5-gallon buckets and scanned with a PID. All PID readings of the IDW were below 5 ppm. Decontamination water was not disposed of at each sampling location as indicated in the work plan. The water was changed as needed, screened and disposed of at the last sampling location or at the sample processing area. The change was approved by the USACE on April 24, 2013, as noted in E & E's field logbook.

2.10 Documentation

Daily activity summary sheets were generated and submitted to the USACE and EPA the day after each day of fieldwork. The daily summary sheets documented the field activities associated with the sampling that was conducted. Although some field activities were adjusted slightly from what was proposed in the work plan, no Field Adjustment Forms were needed per approval from the USACE. In addition, QC checklist forms including the Decontamination Checklist; Field Documentation Checklist; and Sample Collection and Packing, Storing, and Shipment of Samples Checklist were completed in the field each day. The IDW Management Checklist was also completed weekly. The Daily Safety Meeting Record was completed daily and included health and safety topics for the site. These forms are included in the QCSR (see Appendix C). Two additional E & E personnel were on-site April 24, 2013, to conduct a Quality Assurance and Health and Safety Audit. A copy of the audit is included in the QCSR (see Appendix C). A USACE representative also conducted a Field Audit on April 25, 2013, not included in this report.

Additionally a QCSR was generated after the field program was completed. The QCSR includes: a summary of the sampling event including analytical results; deviations from the proposed sampling and analysis procedures; discussion of inspections and audits; and results of the data quality evaluation associated with the sampling event (see Appendix C).

Table 2-1 Sample Locations in OU3 - April 2013
Radiation Technology Superfund Site, Rockaway Township, New Jersey

Proposed Location ID ¹	Location Description	Sample Collected	Date Sample Collected
P2 Area			
R-47			
R-47 is constructed on concrete and cinderblock, and contains an AST. R-47 had drums of petroleum products and unlabeled drums removed by EPA located in Edison, New Jersey (managed these drums under a different program); stains remain on the concrete floor.			
R47-CON-01	Crack in concrete floor in northern portion of the building.	R47-CON-01 (and duplicate sample R47-CON-R7)	4/25/2013
R47-CON-02	Stained area in concrete floor in the southern portion of the building.	R47-CON-02	4/25/2013
R47-CBK-01	Cinder block wall on west side of the building.	R47-CBK-01	4/25/2013
R47-AST-01	Contents of AST, which is located on west side of the building.	AST dry, no sample collected.	NA
R47-UST-01	If UST presence is confirmed on the west side of the building, sample contents.	No UST observed, no sample collected.	NA
Paint Locker			
Paint Locker is constructed of concrete and cinder block, and contains caulk on windows and doors. It is filled with debris.			
Paint Locker-CAULK-01	Caulk on exterior door frame at north end of the building.	PaintLocker-Caulk-01	4/25/2013
Paint Locker-CBK-01	Cinderblock wall along west wall of the building.	PaintLocker-CBK-01	4/25/2013
Paint Locker-CON-01	Concrete floor in the southern portion of the building.	PaintLocker-CON-01	4/25/2013
Acid (Oxidizer) Storage Tank			
Acid (Oxidizer) Storage Tank containment area is constructed of concrete.			
Acid/Ox-CON-01	Concrete floor in the west containment area.	Acid/Ox-CON-01	4/25/2013
Acid/Ox-CON-02	Concrete floor in the east containment area.	Acid/Ox-CON-02	4/25/2013
R-34			
R-34 is constructed of concrete and cinder block. A wall-mounted transformer is located inside and contains oil. Two fiber drums (30 gallons) containing unknown white powder were removed by the EPA located in Edison, New Jersey (managed under a different program).			
R34-CON-01	Concrete floor near a drain in the western portion of the building.	R34-CON-01	4/25/2013
R34-CON-02	Concrete floor in the former welding room of the building.	R34-CON-02 (and duplicate sample R34-CON-R6)	4/25/2013
R34-CBK-01	Cinder block wall in the southern portion of the building.	R34-CBK-01	4/25/2013
R34-OIL-01	Transformer oil located on wall.	R34-OIL-01	4/26/2013
South Stand Area			
Test Stand 12 (S-12)			
S-12 is constructed of concrete and contains caulk.			
S12-CON-01	Concrete floor in first bay (westernmost) outside the building, area beneath rocket motor exhaust.	S12-CON-01	4/25/2013
S12-CON-02	Concrete floor in the building, near the floor drain.	S12-CON-02	4/25/2013
S12-CAULK-01	Caulk from the door frame in the building.	S12-Caulk-01	4/25/2013
S-46			
S-46 is constructed of concrete and cinder block. Contains caulk around the door. AST is located outside the building.			
S46-CON-01	Crack in concrete floor, near a floor drain, in the western portion of the building.	S46-CON-01	4/24/2013
S46-CON-02	Concrete floor near a floor drain in the eastern portion of the building. Concrete floor had a layer of coating/paint.	S46-CON-02	4/24/2013
S46-CBK-01	Cinder block wall in the western portion of the building.	S46-CBK-01	4/24/2013
S46-CAULK-01	Caulk from several window frames and pipes outside of the building. Newer caulk was also observed but was not sampled.	S46-Caulk-01	4/24/2013
S46-AST-01	Contents of abandoned AST, which is located on the south side of the building.	AST dry, no sample collected.	NA

Table 2-1 Sample Locations in OU3 - April 2013
Radiation Technology Superfund Site, Rockaway Township, New Jersey

Proposed Location ID ¹	Location Description	Sample Collected	Date Sample Collected
Test Stand 11 (S-11)			
S-11 is constructed of concrete and cinder block.			
S11-CON-01	Concrete floor sample of the test stand, area beneath rocket motor exhaust.	S11-CON-01 (and duplicate sample S11-CON-R4)	4/24/2013
S11-CON-02	Concrete wall sample of the test stand.	S11-CON-02	4/24/2013
S11-CBK-01	Cinder block wall on the north side of the test stand.	S11-CBK-01	4/24/2013
Test Stand 37 (S-37)			
S-37 is constructed of cinder block and concrete.			
S37-CBK-01	Cinder block north wall sample of the test stand.	S37-CBK-01	4/27/2013
S37-CON-01	Concrete floor sample (partially broken concrete, discoloration and weathered) of the test stand, area beneath rocket motor exhaust.	S37-CON-01 (and duplicate sample S37-CON-01-R5)	4/24/2013
S37-CON-02	Concrete southeast wall sample of the test stand.	S37-CON-02	4/24/2013
No. 1 Sewage Treatment Plant			
No. 1 Sewage Treatment Plant contains water, no sludge observed.			
No.1STP-SLUDGE-01	Sludge sample from contents of the sewage treatment plant.	No sludge in sewage treatment plant, no sludge sample collected.	NA
No.1STP-WATER-01	Water sample from the contents of the sewage treatment plant.	No1STP-Water-01	4/26/2013
S-48			
S-48 is constructed of concrete.			
S48-CON-01	Crack in concrete floor sample in southern end of the concrete pad.	S48-CON-01	4/24/2013
S48-CON-02	Concrete floor sample in the northern end of the concrete pad.	S48-CON-02 (and duplicate sample S48-CON-R2)	4/24/2013
T-50			
T-50 is constructed of concrete.			
T50-CON-01	Concrete floor sample of the eastern portion of the concrete pad. Top layer of concrete has approximately 1/8" of tiles with some mastic	T50-CON-01	4/24/2013
T50-CON-02	Concrete floor sample of the western portion of the concrete pad. Top layer of concrete has approximately 1/8" of tiles with some mastic	T50-CON-02 (and duplicate sample T50-CON-02-R3)	4/24/2013
S-49			
S-49 is constructed of concrete, cinder block and caulk. Cistern contents include water, no sludge observed.			
S49-CON-01	Concrete floor sample of the northwestern concrete pad.	S49-CON-01	4/24/2013
S49-CBK-01	Cinder block sample collected from dilapidated cinder block located on southeast portion of the pad.	S49-CBK-01	4/24/2013
S49-CAULK-01	Caulk sample from the door located in the southwest portion of the structure.	S49-Caulk-01	4/24/2013
S49-WATER-01	Water sample from the contents of the cistern.	No water in the cistern, no sample collected.	NA
S49-SLUDGE-01	Sludge sample from the contents of the cistern.	No sludge in the cistern, no sample collected.	NA
East Stand Area			
Test Stand 2 (R-2)			
R-2 is constructed of concrete.			
R2-CON-01	Concrete floor sample of the test stand (in test cell), area beneath rocket motor exhaust	R2-CON-01	4/23/2013
R2-CON-02	Concrete wall sample (east wall) of the test stand (in test cell).	R2-CON-02	4/23/2013
R-33			
R-33 is constructed of concrete. Soil outside of door on south side not previously sampled, and based on previous investigations, there were high			
R33-CON-01	Concrete floor sample in the building.	R33-CON-01	4/22/2013
R33-SOIL-01	Soil sample collected outside of the door on the south side.	R33-SOIL-01	4/22/2013

Table 2-1 Sample Locations in OU3 - April 2013
Radiation Technology Superfund Site, Rockaway Township, New Jersey

Proposed Location ID ¹	Location Description	Sample Collected	Date Sample Collected
R-29			
R-29 is constructed of concrete.			
R29-CON-01	Concrete floor sample in the center of the building.	R29-CON-01	4/22/2013
R-21			
R-21 is constructed of concrete, cinder block and caulk. Approximately 30 drums/containers (55-, 30- and 5-gallon) were removed from the room			
R21-CON-01	Concrete floor sample (in stained area) of the	R21-CON-01	4/22/2013
R21-CON-02	Concrete floor sample (from stained area on the floor from the former drums) of the building.	R21-CON-02	4/22/2013
R21-CAULK-01	Caulk sample of the door frames and window frames located in the building.	R21-Caulk-01	4/22/2013
R21-CBK-01	Cinder block wall in the former lab room of the building.	R21-CBK-01	4/22/2013
R21-SLUDGE-01	Contingency Sample: Snake the floor drain and sample the sludge if retrievable	No sludge in the floor drain, no sludge sample collected.	NA
R21-CON-03	Contingency Sample: If a sludge sample from the floor drain cannot be obtained, collected a concrete sample near the floor drain (1 inch deep).	R21-CON-03	4/22/2013
R21-SOIL-01	Core through the concrete floor and obtain a soil sample if concrete is less than 6 inches thick. This sample will be collected from the lowest pitch point in the room.	R21-SOIL-01 (and duplicate sample R21-SOIL-R1)	4/22/2013
Test Stand 3 (R-3)			
R-3 is constructed of concrete and caulk.			
R3-CON-01	Concrete floor center of the test stand (in test cell), area beneath rocket motor exhaust.	R3-CON-01	4/23/2013
R3-CON-02	Concrete wall sample (north wall) of the test stand (in test cell).	R3-CON-02	4/23/2013
R3-CAULK-01	Caulk sample from door frames in the test stand.	R3-Caulk-01	4/23/2013
R-51			
R-51 is constructed of concrete.			
R51-CON-01	Concrete floor sample in the northern portion of the building.	R51-CON-01	4/23/2013
R51-CON-02	Concrete floor sample in the southern portion of the building.	R51-CON-02	4/23/2013
Test Stand 4 (R-4)			
R-4 is constructed of concrete and cinder block. The sludge in a 5-gallon bucket and fiber drum (30 gallons) containing unknown white powder was			
R4-CON-01	Concrete floor sample in the northern portion of the main test room.	R4-CON-01	4/23/2013
R4-CON-02	Concrete floor sample in the western portion of the main test room.	R4-CON-02	4/23/2013
R4-CON-03	Concrete floor sample of the small laboratory room (west).	R4-CON-03	4/23/2013
R4-CON-04	Concrete floor sample of the small laboratory room (east).	R4-CON-04	4/23/2013
R4-CON-05	Concrete floor sample in trough located in east side of the small test room.	R4-CON-05	4/23/2013
R4-CON-06	Concrete floor sample in trough located on west side of small test room.	R4-CON-06	4/23/2013
R4-CON-07	Concrete floor sample in trough located on west side of small test room. Observed black and red staining in the concrete when coring.	R4-CON-07	4/23/2013
R4-CBK-01	Cinder block wall in the hallway of the building.	R4-CBK-01	4/23/2013
R4-SLUDGE-01	Sludge sample from the bucket in the small laboratory room.	Sludge bucket previously removed by EPA, no sludge sample collected.	NA
Cistern/Cistern Pump			
Cistern/Cistern Pump contains water, no sludge observed.			
CISTERN-WATER-01	Water sample from the cistern.	Cistern-Water-01	4/26/2013
CISTERN-SLUDGE-01	Sludge sample from the cistern.	No sludge in the cistern, no sample collected.	NA

Table 2-1 Sample Locations in OU3 - April 2013
Radiation Technology Superfund Site, Rockaway Township, New Jersey

Proposed Location ID ¹	Location Description	Sample Collected	Date Sample Collected
Scrubber			
Scrubber is constructed of concrete.			
SCRUBBER-CON-01	Concrete floor sample from the upper level.	Scrubber-CON-01	4/23/2013
SCRUBBER-CON-02	Concrete floor sample from the lower level.	Scrubber-CON-02	4/23/2013
Water Cooling Tower			
The foundation of the Water Cooling Tower is constructed of concrete.			
WCT-CON-01	Concrete sample from southern corner of outside foundation floor of the building. Interior of building had approximately 6 inches of water.	WCT-CON-01	4/23/2013
Condenser and Hotwell			
Condenser and Hotwell are constructed of concrete.			
CON/HW-CON-01	Concrete floor sample from the first chamber (hotwell).	Con/HW-CON-01	4/23/2013
CON/HW-CON-02	Concrete floor sample from the condenser.	Con/HW-CON-02	4/23/2013
Water Tower			
Water Tower contains an AST with oily water.			
WATERTOWER-AST-01	Contents of AST, which is located on east side of the small tower.	WaterTower-AST-01	4/26/2013
Agitator and Effluent Treatment Basin			
Agitator and Effluent Treatment Basin is constructed of concrete and cinder block.			
AGITATOR-CON-01	Concrete floor sample from the agitator.	Agitator-CON-01	4/23/2013
AGITATOR-CBK-01	Cinder block north wall sample from the agitator.	Agitator-CBK-01	4/23/2013

Note:

¹Sample Location ID: R47-CON-01 is interpreted as follows:

R47	Indicates the building or structure being sampled;
CON	Indicated type of medium (in this case, concrete sample);

- Additional buildings/structures (Old Water Tower, Building Associated with the Old Water Tower, Igniter Storage Building, and the Pump House 2) were sampled during the asbestos and lead paint surveys. Information is included in Sections 2.3.7.1 (asbestos) and 2.3.7.2 (lead), and Appendix B of the OU-3 RI report.

Sample Types:

AST = aboveground storage tank contents sample

CAULK = caulk sample

CBK = cinderblock sample

CON = concrete sample

OIL = oil from wall mounted transformer

Sludge = sludge from tank/cistern

Soil = soil sample

UST = underground storage tank contents sample

Water = water sample from tank/cistern

Table 2-2 Water Sample Parameters
Radiation Technology Superfund Site, Rockaway Township, New Jersey

Sample ID		Date	Time	pH	Conductivity (μS)	Temperature (°C)	ORP (mV)	Turbidity (NTU)	PID (ppm)
CISTERN-WATER-01	Start	4/26/2013	1103	7.43	422.3	9.6	168	2.44	0
CISTERN-WATER-01	End	4/26/2013	1130	7.92	301.5	12.4	-50	4.42	0
NO1STP-WATER-01	Start	4/26/2001	1430	8.12	68.19	12.1	100	5.52	0
NO1STP-WATER-01	End	4/26/2013	1450	7.71	75.52	11.8	-67	7.57	0

Key:

μS = Microsiemens

°C = Degrees Celsius

ORP = Oxygen Reduction Potential

mV = Millivolts

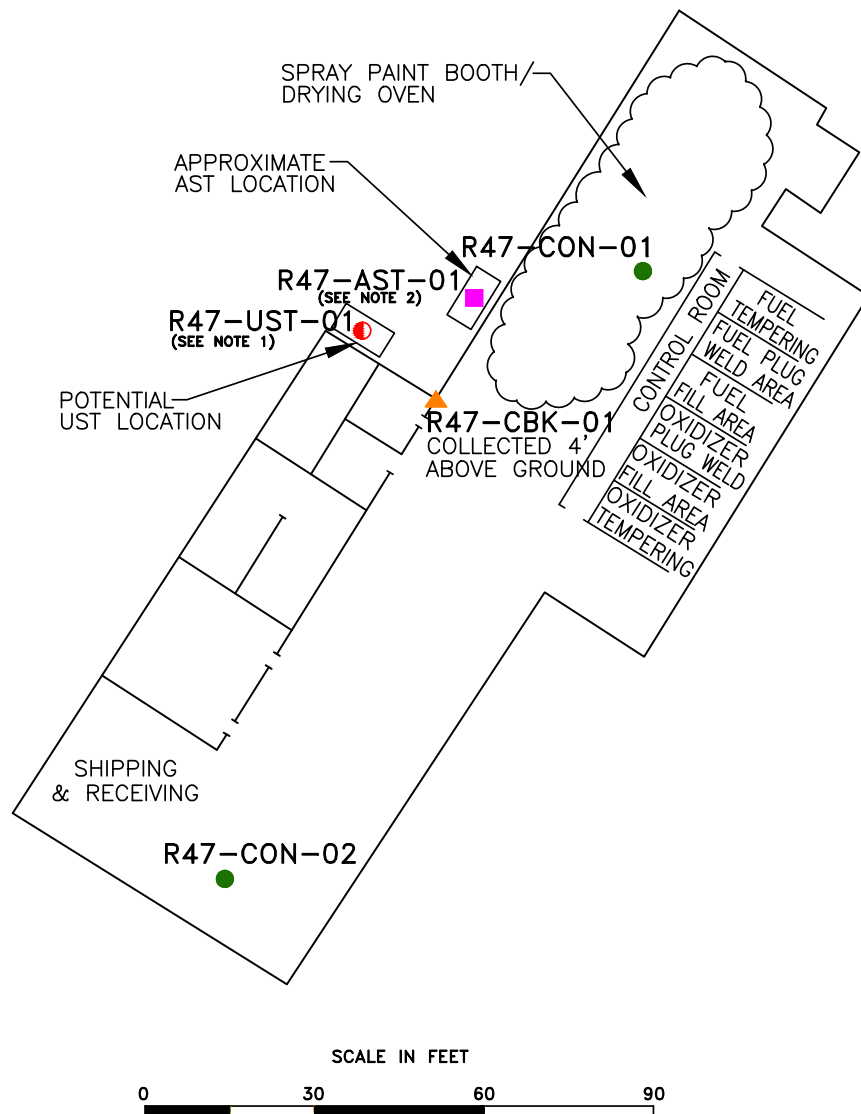
NTU = Nephelometric Turbidity Units

PID = Photoionization detector

ppm = parts per million



R-47 (P2 AREA)



LEGEND

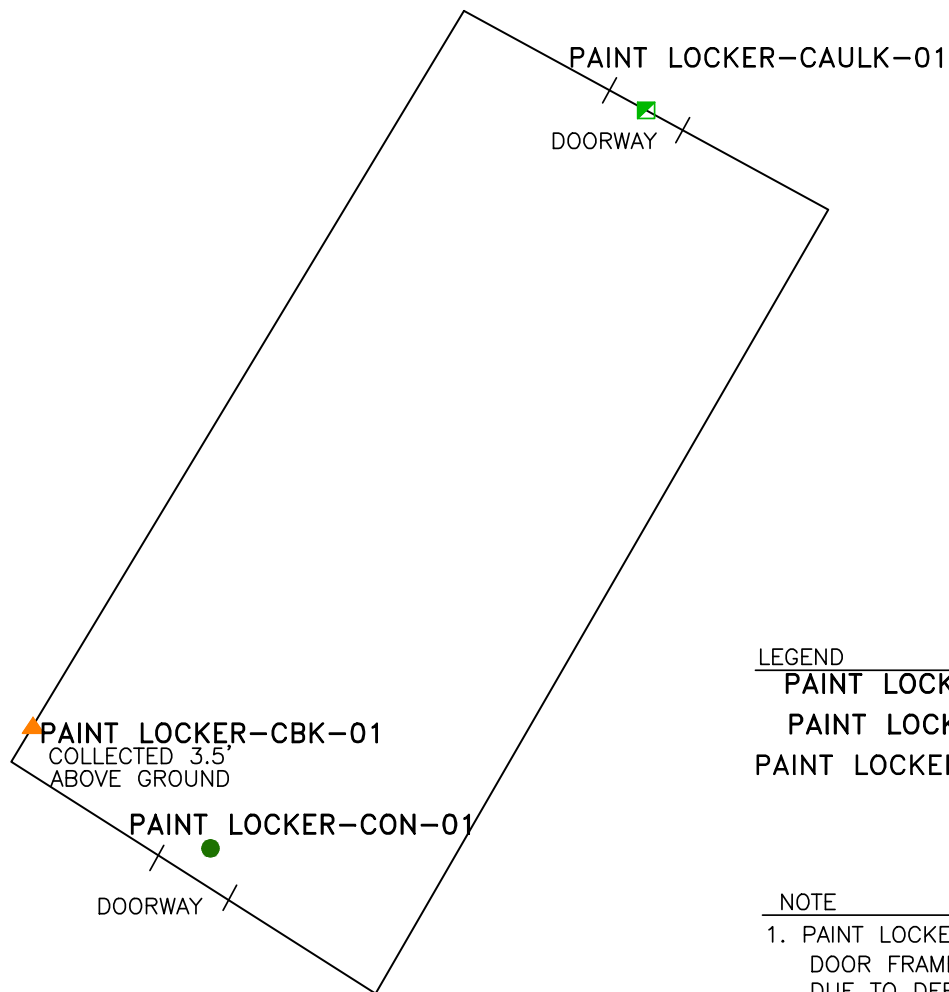
R47-CON-01	●	CONCRETE SAMPLE
R47-AST-01	■	ABOVE GROUND STORAGE TANK SAMPLE
R47-UST-01	●	UNDERGROUND STORAGE TANK SAMPLE
R47-CBK-01	▲	CINDERBLOCK SAMPLE

NOTES

1. NO UST EXISTS AT LOCATION R47-UST-01, THEREFORE NO SAMPLE WAS COLLECTED.
2. LOCATION R47-AST-01 WAS DRY, THEREFORE NO SAMPLE WAS COLLECTED.
3. DUPLICATE SAMPLE R47-CON-R7 WAS COLLECTED AT R47-CON-01 LOCATION.
4. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



PAINT LOCKER (P2 AREA)



LEGEND

PAINT LOCKER-CON-01 ●	CONCRETE SAMPLE
PAINT LOCKER-CBK-01 ▲	CINDERBLOCK SAMPLE
PAINT LOCKER-CAULK-01 ■	CAULK SAMPLE

NOTE

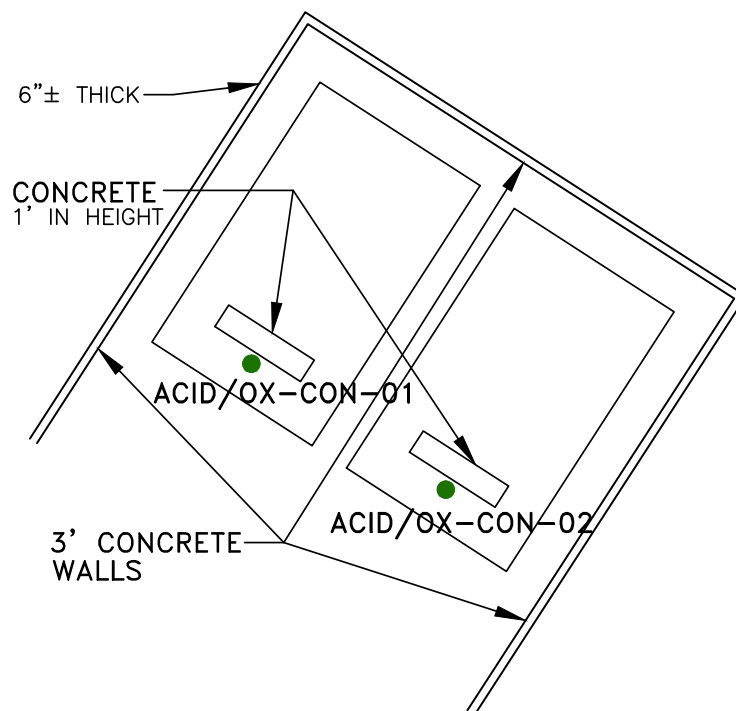
1. PAINT LOCKER-CAULK-01 WAS COLLECTED FROM EXTERIOR DOOR FRAME. COULD NOT ACCESS INTERIOR DOOR FRAME DUE TO DEBRIS.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



2-23



ACID (OXIDIZER) STORAGE TANK (P2 AREA)



LEGEND

ACID/OX-CON-01 ● CONCRETE SAMPLE

NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

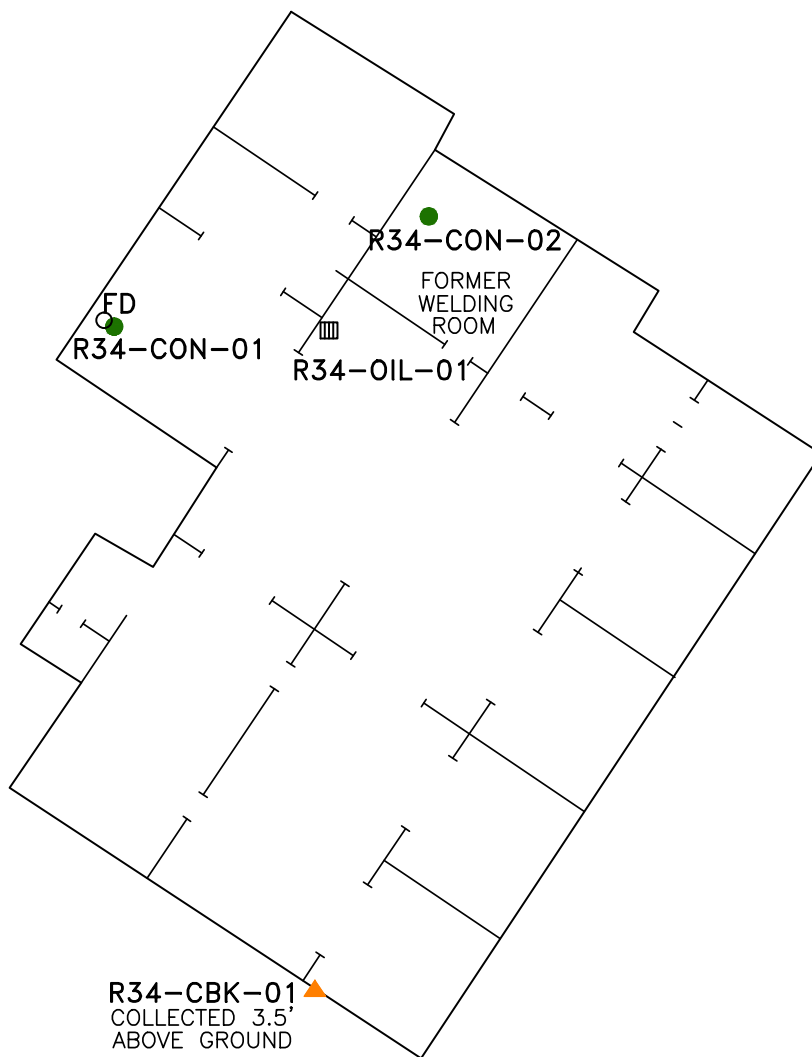


2-24

2-25



R-34 (P2 AREA)



LEGEND

R34-CON-01 ●	CONCRETE SAMPLE
R34-CBK-01 ▲	CINDERBLOCK SAMPLE
R34-OIL-01 ▨	TRANSFORMER OIL
FD ○	FLOOR DRAIN

NOTES

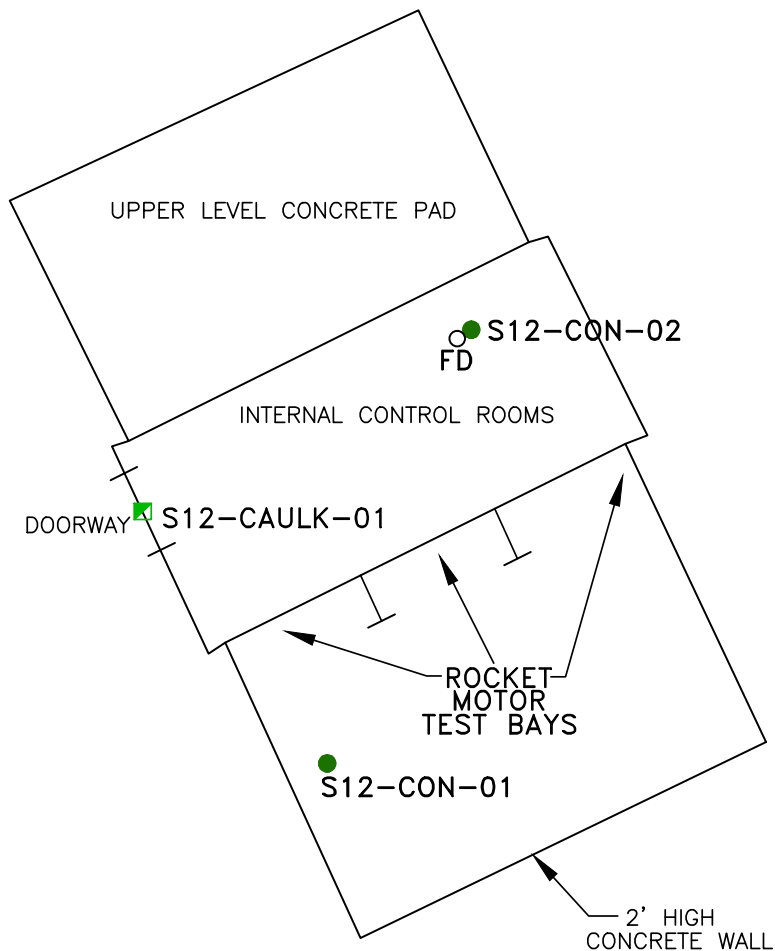
1. DUPLICATE SAMPLE (R34-CON-R6) TAKEN AT R34-CON-02.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

SCALE IN FEET





TEST STAND 12 S-12 (SOUTH STAND AREA)



LEGEND

S12-CON-01 ●	CONCRETE SAMPLE
S12-CAULK-01 ■	CAULK SAMPLE
FD ○	FLOOR DRAIN

NOTES

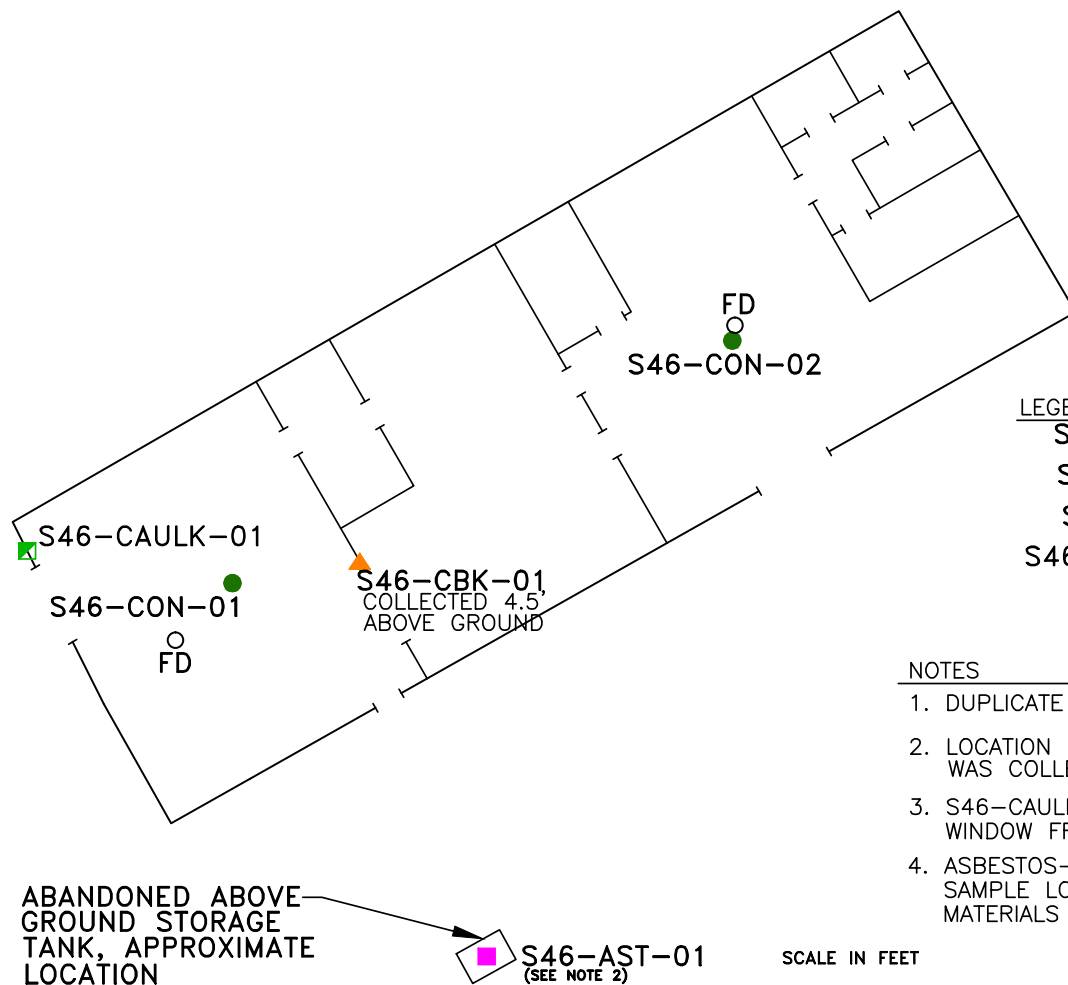
1. S12-CAULK-01 COLLECTED FROM DOOR FRAME.
2. DUPLICATE SAMPLE (R34-CON-R6) COLLECTED AT R34-CON-02 LOCATION.
3. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

2-26



S-46 (SOUTH STAND AREA)

2-27



LEGEND

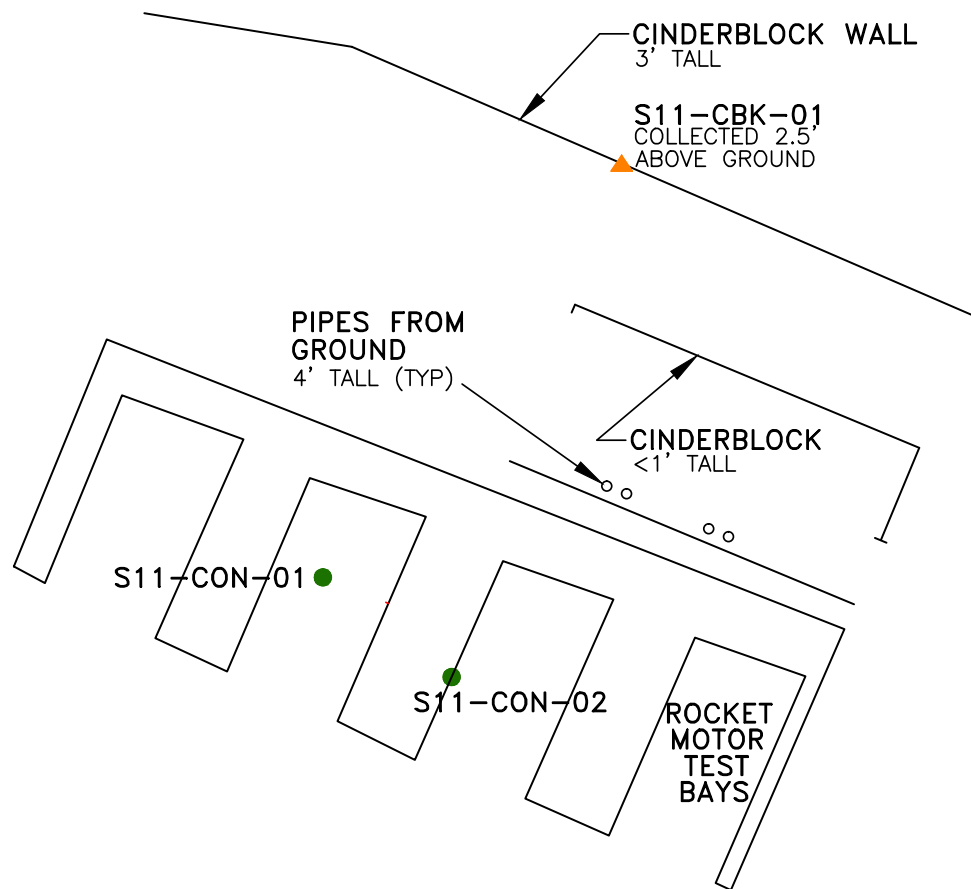
S46-CON-01	●	CONCRETE SAMPLE
S46-CBK-01	▲	CINDERBLOCK SAMPLE
S46-AST-01	■	ABOVE GROUND STORAGE TANK SAMPLE
S46-CAULK-01	■	CAULK SAMPLE
FD	○	FLOOR DRAIN

NOTES

1. DUPLICATE SAMPLE (S46-CON-R2) TAKEN AT S46-CON-02.
2. LOCATION S46-AST-01 WAS DRY, THEREFORE NO SAMPLE WAS COLLECTED.
3. S46-CAULK-01 WAS COLLECTED FROM DOOR FRAMES AND WINDOW FRAMES THROUGHOUT THE BUILDING.
4. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



TEST STAND 11 S-11 (SOUTH STAND AREA)



LEGEND

- S11-CON-01 ● CONCRETE SAMPLE
S11-CBK-01 ▲ CINDERBLOCK SAMPLE

NOTES

1. DUPLICATE SAMPLE (S11-CON-R4) COLLECTED AT S11-CON-01 LOCATION.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

FIGURE 2-7

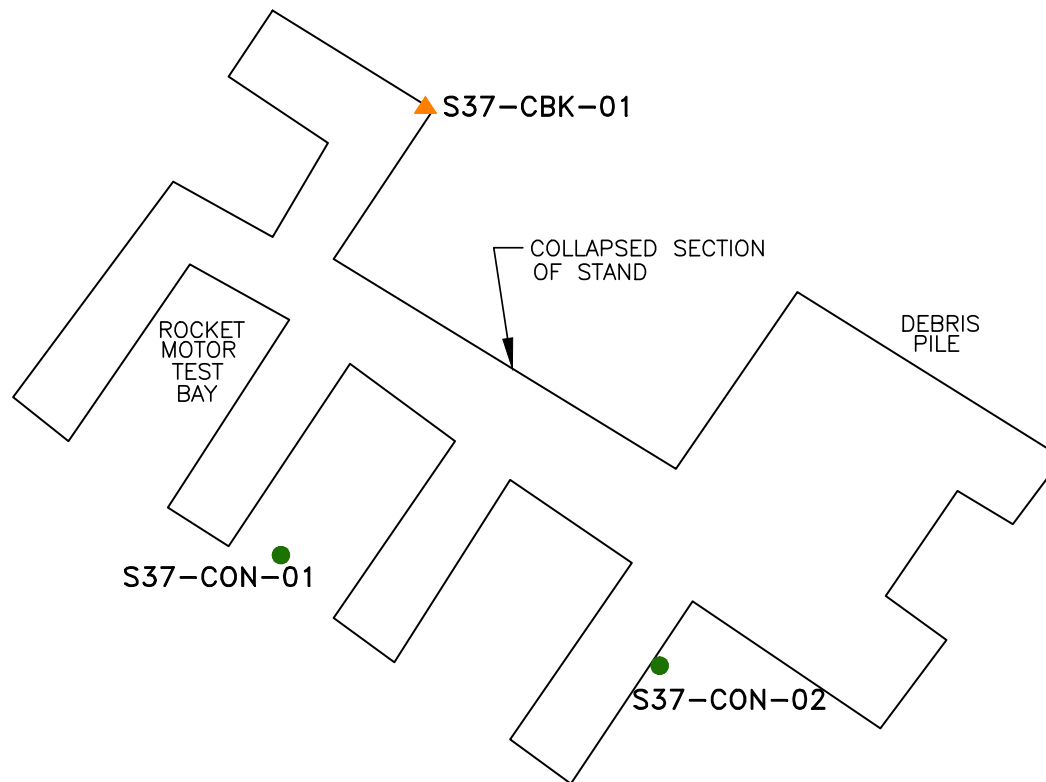
SAMPLE LOCATIONS, S-11
RADIATION TECHNOLOGY SUPERFUND SITE, OU3
ROCKAWAY TOWNSHIP, NEW JERSEY

R2-0001807

2-29



TEST STAND 37 S-37 (SOUTH STAND AREA)



SCALE IN FEET



LEGEND

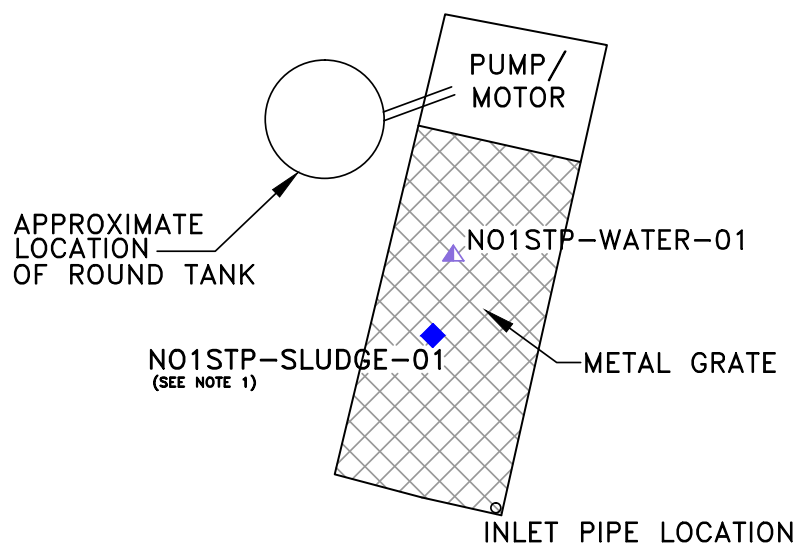
S37-CON-01	●	CONCRETE SAMPLE
S37-CBK-01	▲	CINDERBLOCK SAMPLE

NOTES

1. DUPLICATE SAMPLE (S37-CON-D1-RS) COLLECTED AT S37-CON-01 LOCATION.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT
SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS
MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



No. 1 SEWAGE TREATMENT PLANT (SOUTH STAND AREA)



LEGEND

NO1STP-SLUDGE-01	◆	SLUDGE SAMPLE
NO1STP-WATER-01	▲	WATER SAMPLE

NOTES

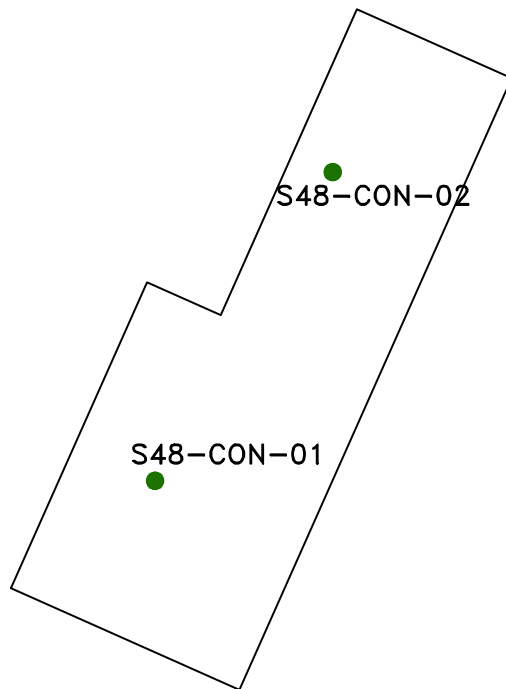
1. NO SLUDGE ENCOUNTERED AT NO1STP-SLUDGE-01, THEREFORE, NO SAMPLE WAS COLLECTED.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



2-30



S-48 (SOUTH STAND AREA)



LEGEND

S48-CON-01 ● CONCRETE SAMPLE

NOTES

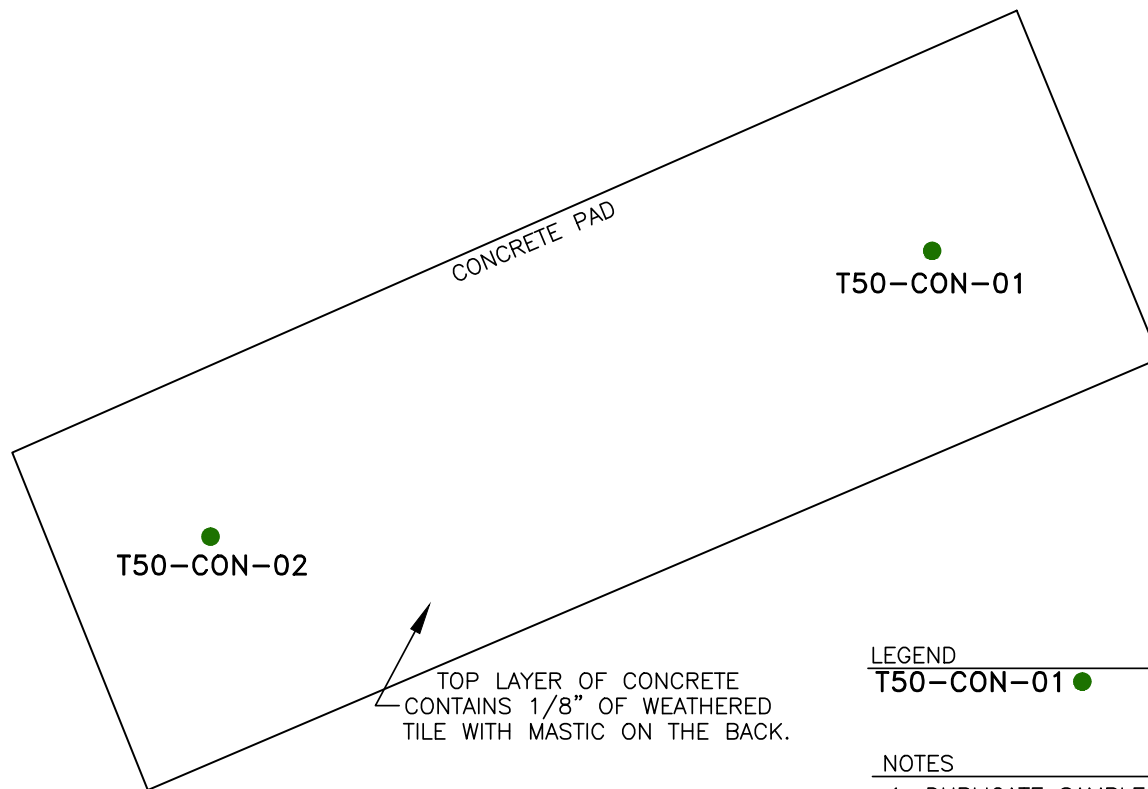
1. DUPLICATE SAMPLE (S48-CON-R2) COLLECTED AT S48-CON-02 LOCATION.
2. CONCRETE SLAB IS ALL THAT REMAINS OF STRUCTURE S-48
4. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

SCALE IN FEET





T-50 (SOUTH STAND AREA)



LEGEND

T50-CON-01 ● CONCRETE SAMPLE

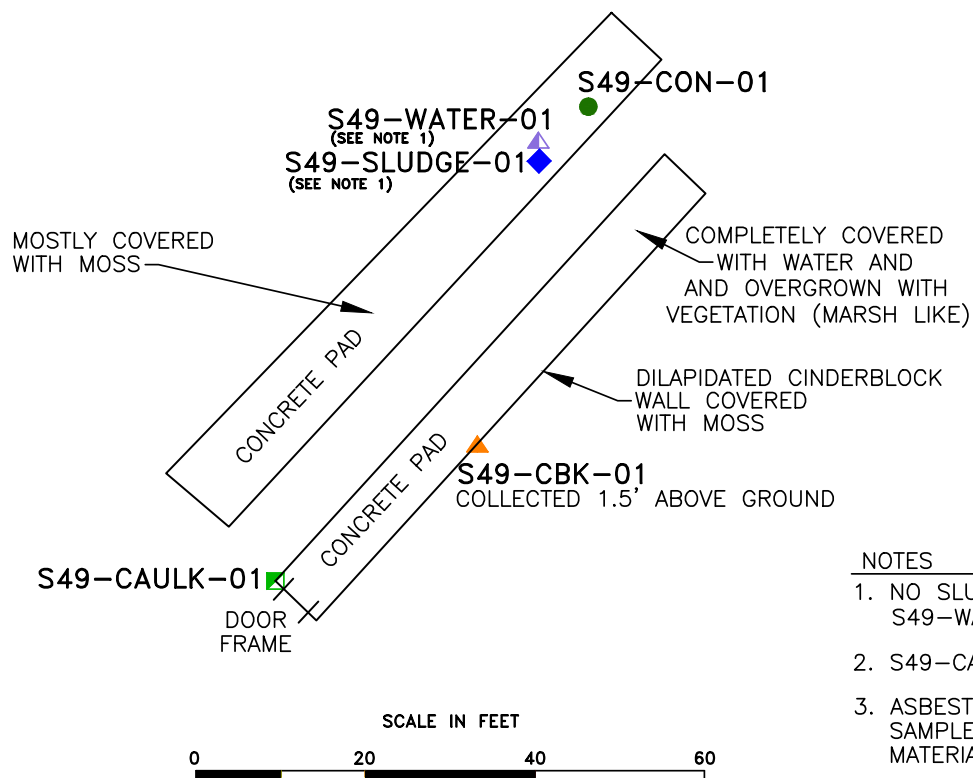
NOTES

1. DUPLICATE SAMPLE (T50-CON-02-R3) COLLECTED AT T50-CON-02 LOCATION.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

2-32



S-49 (SOUTH STAND AREA)



LEGEND

S49-CON-01	●	CONCRETE SAMPLE
S49-CBK-01	▲	CINDERBLOCK SAMPLE
S49-SLUDGE-01	◆	SLUDGE SAMPLE
S49-WATER-01	▲	WATER SAMPLE
S49-CAULK-01	■	CAULK SAMPLE

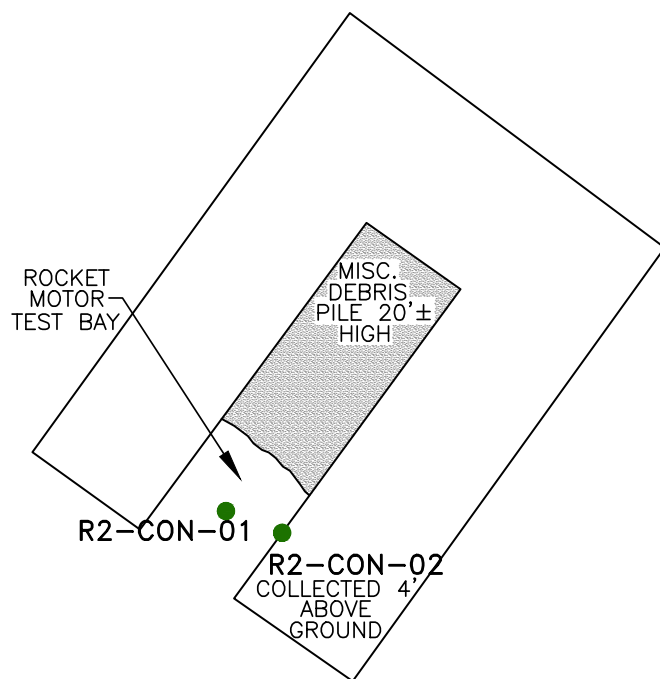
NOTES

1. NO SLUDGE OR WATER ENCOUNTERED AT S49-SLUDGE-01 AND S49-WATER-01, THEREFORE, NO SAMPLES WERE COLLECTED.
2. S49-CAULK-01 WAS COLLECTED FROM THE DOOR FRAME.
3. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

2-33



TEST STAND 2 R-2 (EAST STAND AREA)



LEGEND

R2-CON-01 ● CONCRETE SAMPLE

NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

SCALE IN FEET

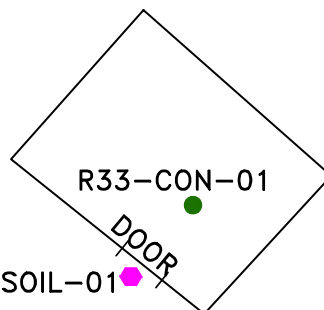
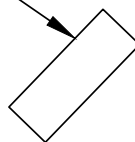


2-34



R-33 (EAST STAND AREA)

CONCRETE
PAD



R33-CON-01

R33-SOIL-01

LEGEND

R33-CON-01 ● CONCRETE SAMPLE

R33-SOIL-01 ● SOIL SAMPLE

NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

SCALE IN FEET



2-35



R-29 (EAST STAND AREA)

R29-CON-01



LEGEND

R29-CON-01 ● CONCRETE SAMPLE

NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

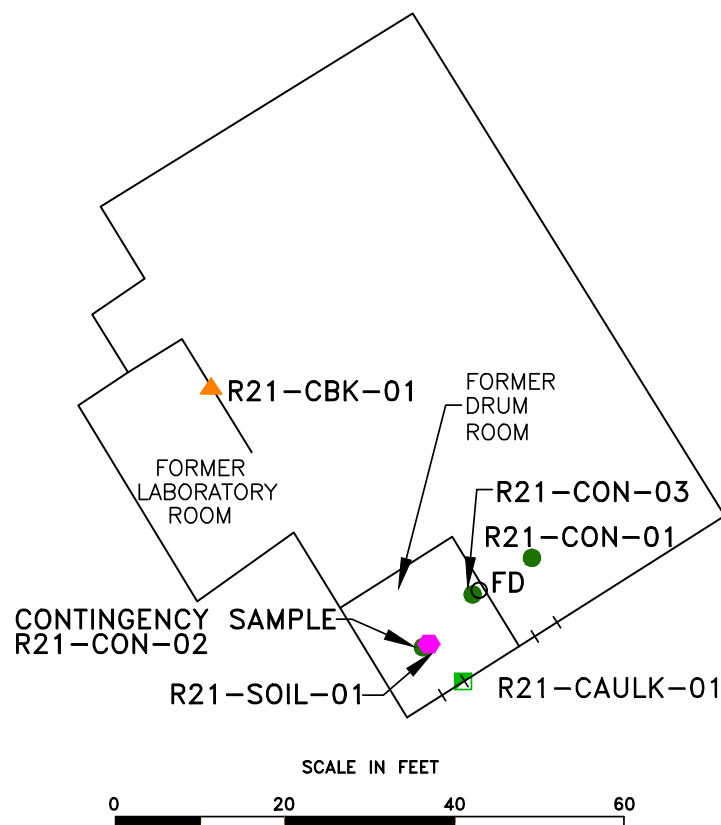
SCALE IN FEET



2-36



R-21 (EAST STAND AREA)



LEGEND

R21-CON-01	●	CONCRETE SAMPLE
R21-CBK-01	▲	CINDERBLOCK SAMPLE
R21-CAULK-01	■	CAULK SAMPLE
R21-SOIL-01	●	SOIL SAMPLE
FD	○	FLOOR DRAIN

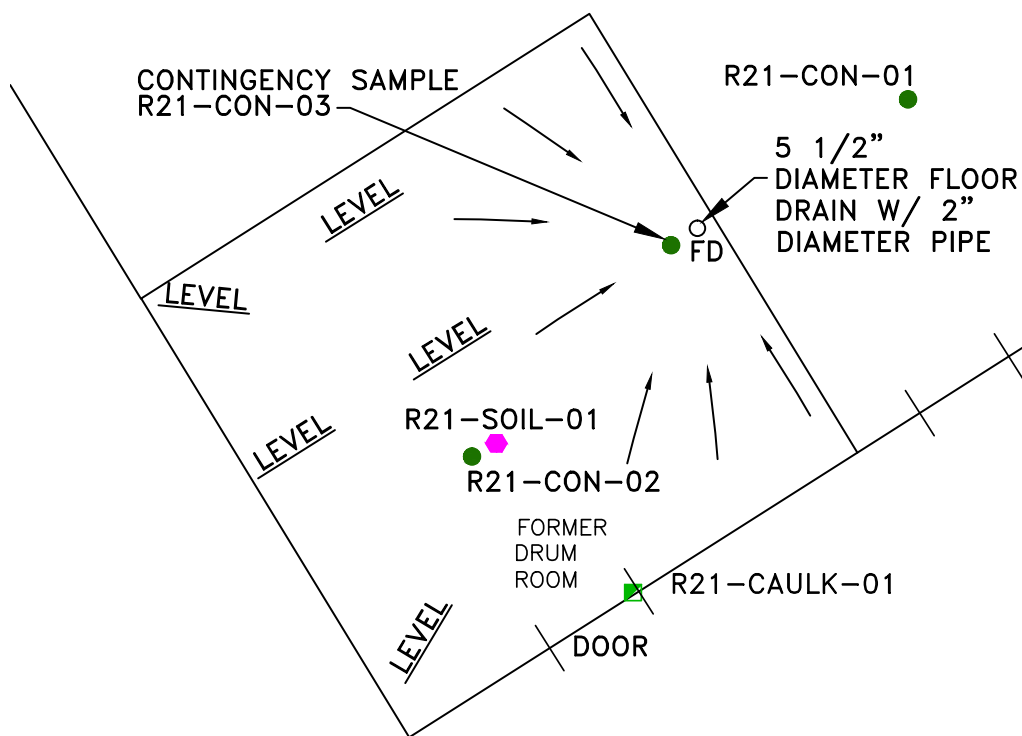
NOTES

1. DUPLICATE SAMPLE (S21-SOIL-R1) COLLECTED AT AT S21-SOIL-01 LOCATION.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

2-37



R-21 (EAST STAND AREA)



LEGEND

R21-CON-01	●	CONCRETE SAMPLE
R21-CBK-01	▲	CINDERBLOCK SAMPLE
R21-CAULK-01	■	CAULK SAMPLE
R21-SOIL-01	●	SOIL SAMPLE
FD	○	FLOOR DRAIN
→		DOWNWARD SLOPE DIRECTIONAL ARROWS

NOTES

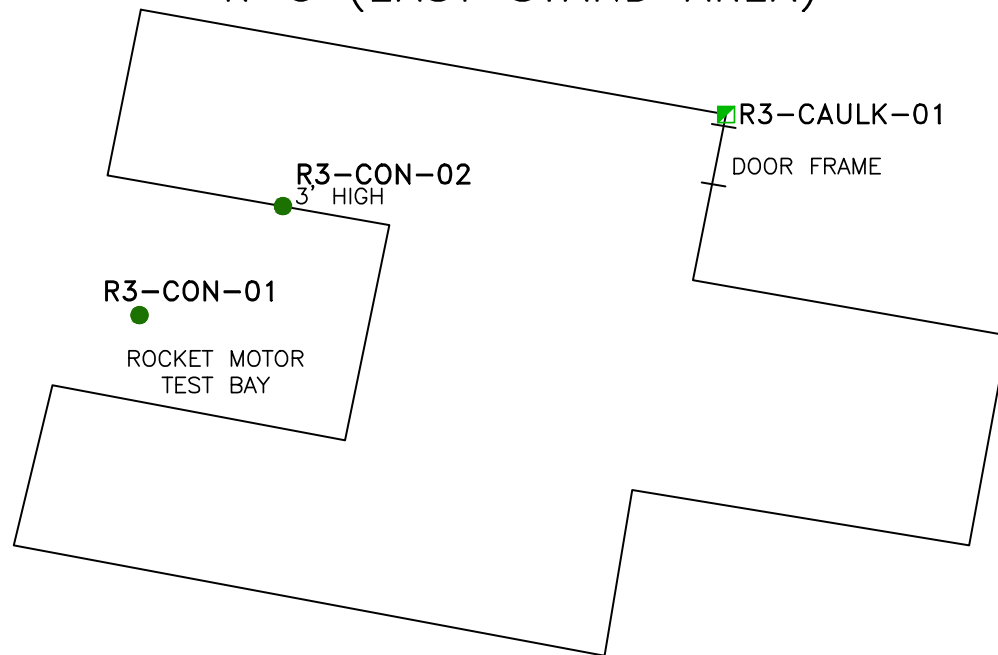
1. DUPLICATE SAMPLE (S21-SOIL-R1) COLLECTED AT S21-SOIL-01 LOCATION.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

SCALE IN FEET





TEST STAND 3 R-3 (EAST STAND AREA)



LEGEND

R3-CON-01	●	CONCRETE SAMPLE
R3-CAULK-01	■	CAULK SAMPLE

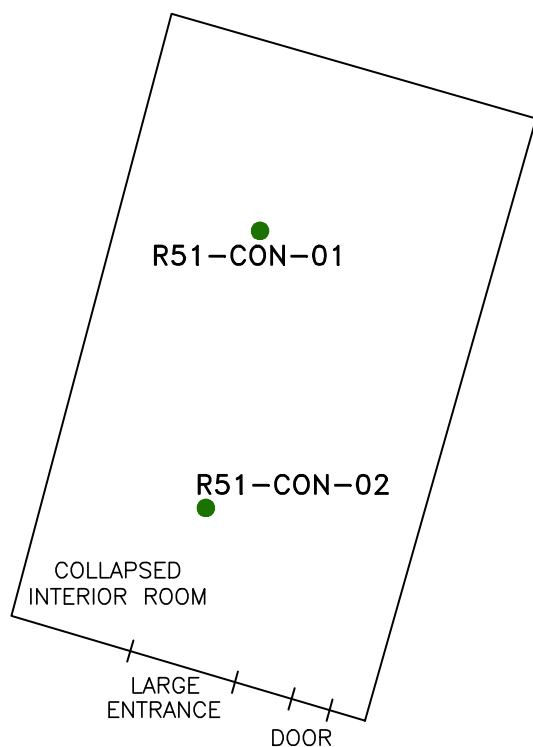
NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

2-39



R-51 (EAST STAND AREA)



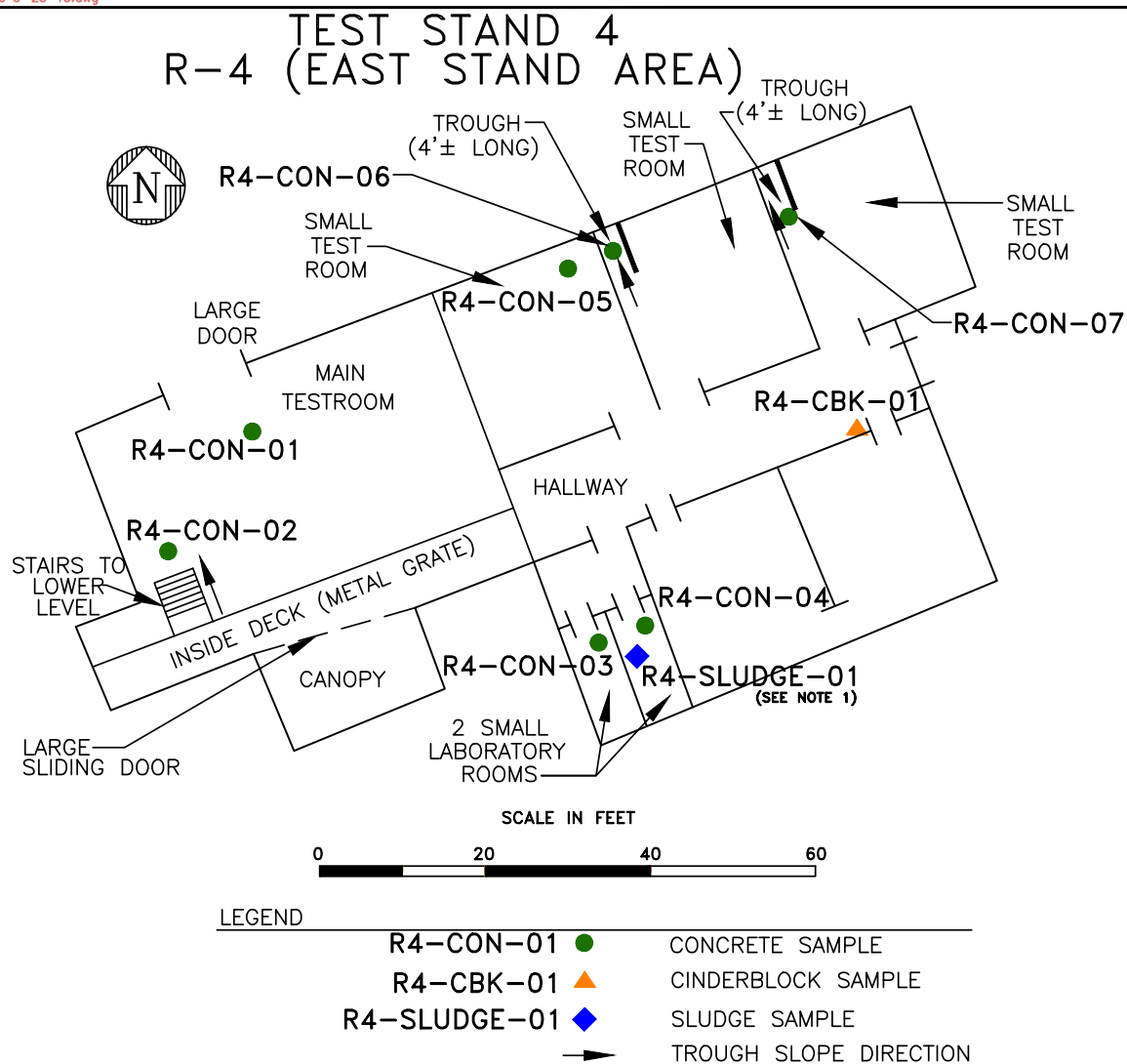
LEGEND

R51-CON-01 ● CONCRETE SAMPLE

NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

SCALE IN FEET
0 20 40 60



NOTES

1. SLUDGE BUCKET WAS PREVIOUSLY REMOVED FROM LOCATION BY USEPA TEAM. THEREFORE, NO SAMPLE WAS COLLECTED AT R4-SLUDGE-01 LOCATION.
2. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

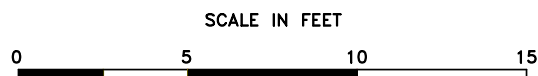
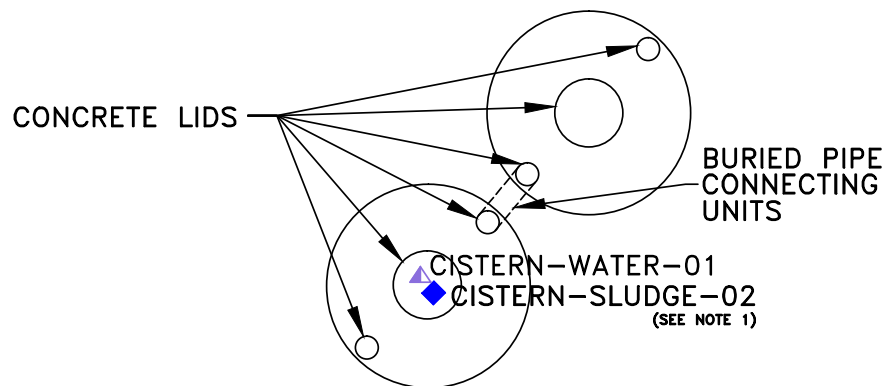
FIGURE 2-19

SAMPLE LOCATIONS, R-4
RADIATION TECHNOLOGY SUPERFUND SITE, OU3
ROCKAWAY TOWNSHIP, NEW JERSEY

R2-0001820



CISTERN/CISTERN PUMP (EAST STAND AREA)



LEGEND

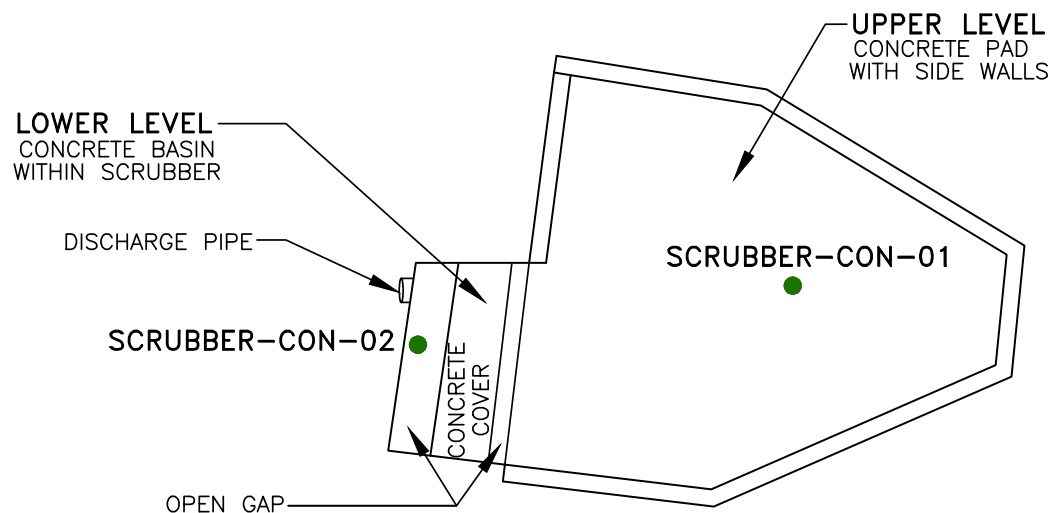
CISTERN-SLUDGE-01	◆	SLUDGE SAMPLE
CISTERN-WATER-01	▲	WATER SAMPLE

NOTES

1. NO SLUDGE ENCOUNTERED IN EITHER CISTERN, THEREFORE, NO SAMPLE WAS COLLECTED.
2. DUPLICATE SAMPLE (CISTERN-WATER-R8) COLLECTED FROM CISTERN-WATER-01 LOCATION.
3. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



SCRUBBER (EAST STAND AREA)



LEGEND

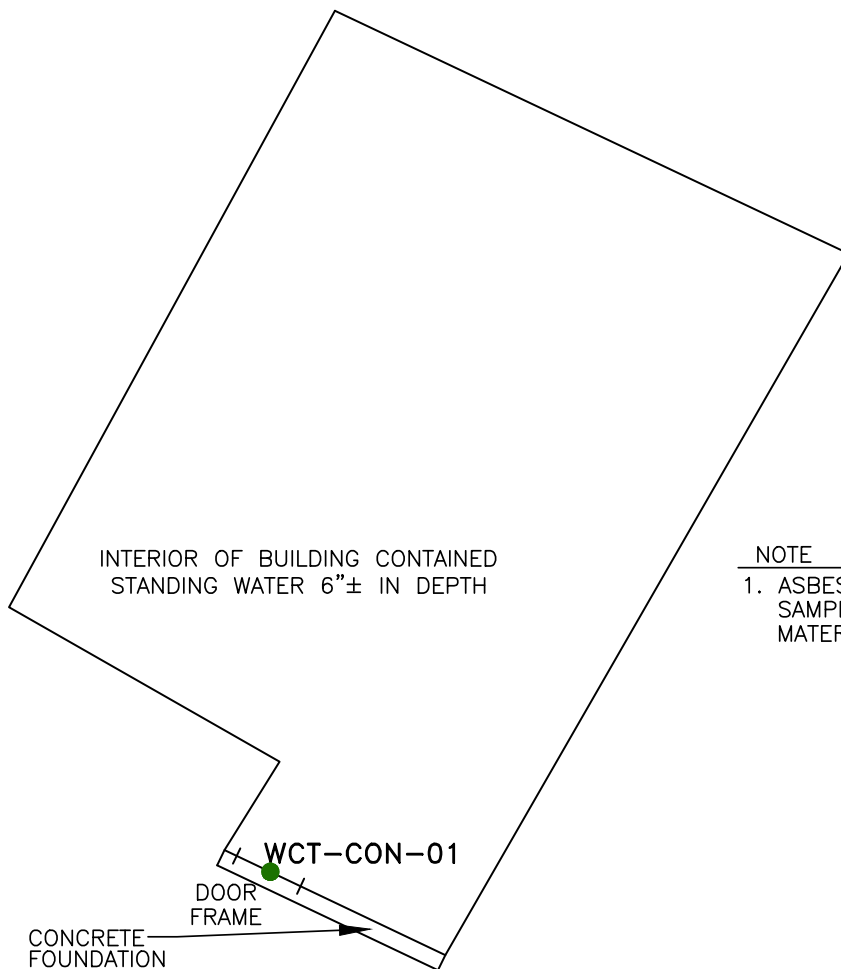
SCRUBBER-CON-01 ● CONCRETE SAMPLE

NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT
SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS
MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



WATER COOLING TOWER (EAST STAND AREA)



LEGEND

WCT-CON-01 ● CONCRETE SAMPLE

NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT
SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS
MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

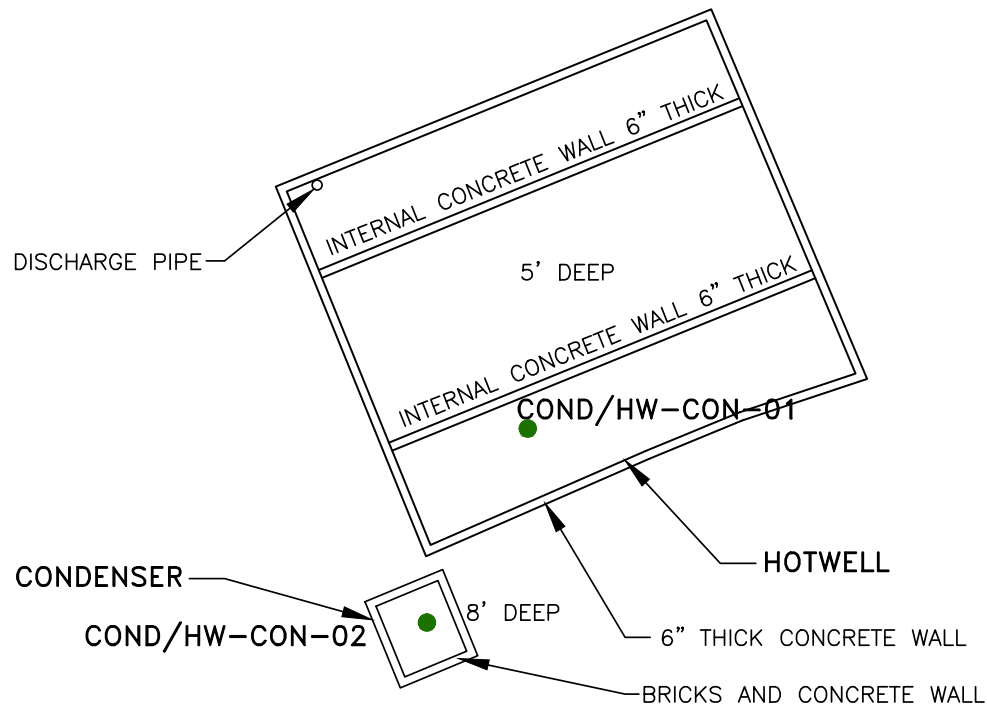
SCALE IN FEET



2-44



CONDENSER AND HOTWELL (EAST STAND AREA)



LEGEND

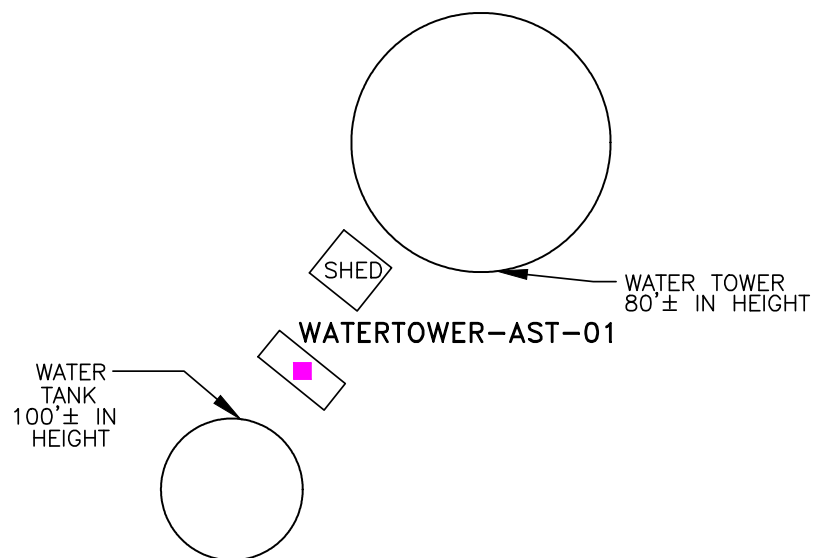
HOTWELL-CON-01 ● CONCRETE SAMPLE

NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



WATER TOWER (EAST STAND AREA)



LEGEND

WATERTOWER-AST-01 ■ ABOVE GROUND STORAGE TANK SAMPLE

NOTE

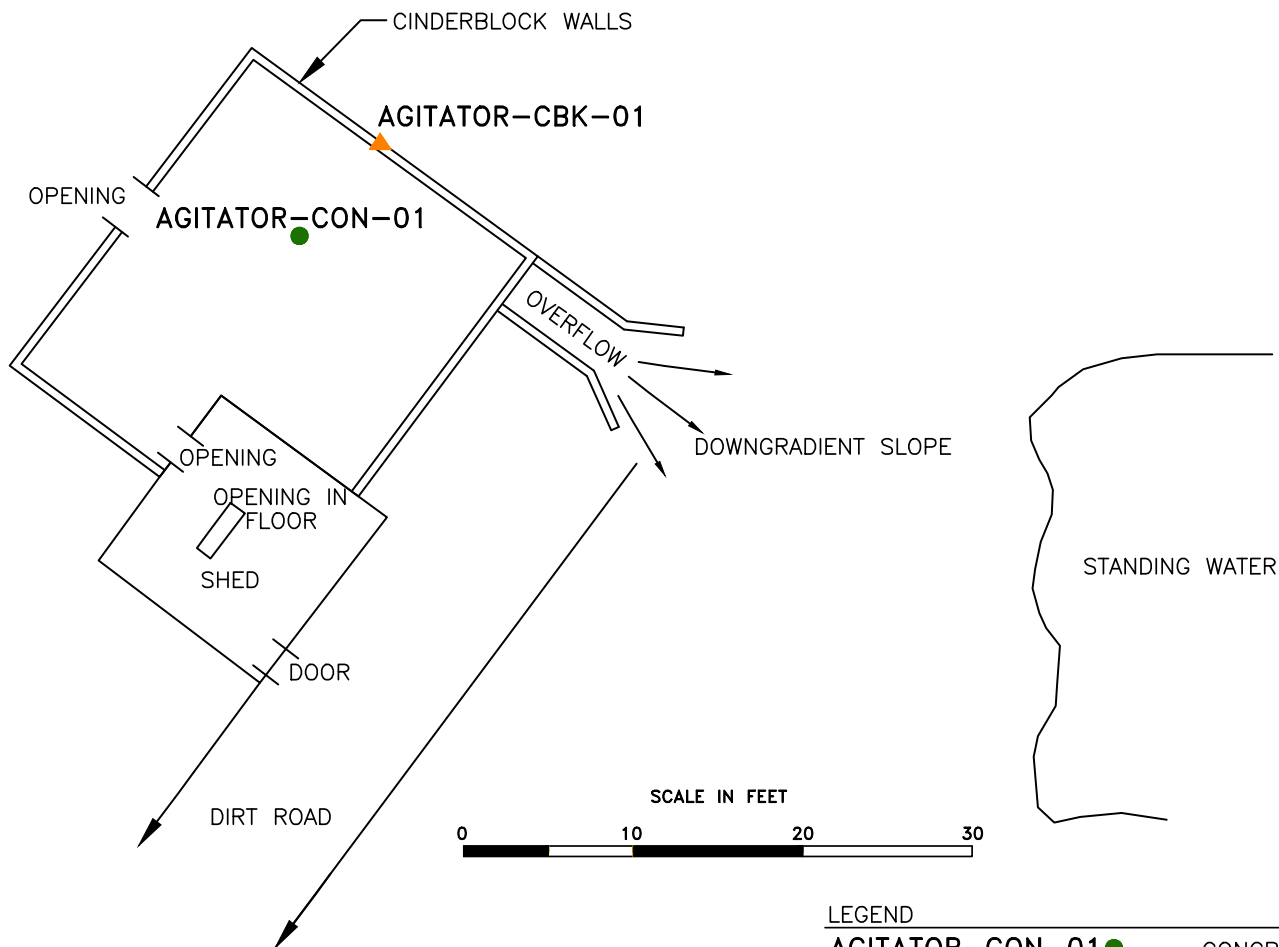
1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).



2-46



AGITATOR AND EFFLUENT TREATMENT BASIN (EAST STAND AREA)



NOTE

1. ASBESTOS-CONTAINING MATERIAL AND LEAD BASED PAINT SAMPLE LOCATIONS ARE INCLUDED IN THE HAZARDOUS MATERIALS SURVEY REPORT (APPENDIX B OF THE RI REPORT).

LEGEND

AGITATOR-CON-01	●	CONCRETE SAMPLE
AGITATOR-CBK-01	▲	CINDERBLOCK SAMPLE
	→	DOWNGRADIENT SLOPE
	→	DIRECTIONAL ARROWS

3

Physical Characteristics of the Study Area

3.1 Environmental Setting

3.1.1 Local Topography and Geology

The RTI Site lies within the New Jersey Highlands, which is part of the Reading Prong of the New England physiographic province. The Reading Prong occurs in southeastern Pennsylvania in the southern parts of Lebanon, Berks, Lehigh, and Northampton counties. The Reading Prong consists of circular to linear, rounded low hills or ridges that project upward in significant contrast to the surrounding lowlands. The hills and ridges are made up of granitic gneiss, granodiorite, and quartzite. These rocks are very resistant to erosion and, thus, the hills and ridges stand higher than the softer sedimentary rocks that surround them. The slopes of these hills and ridges are steep and have a very well defined change in slope where the bases of the hills and ridges meet the lower and gentler slopes of adjacent sections of land. The streams eroding into the hills and ridges are short and steep. Local relief is 300 to 600 feet and elevations range from 140 to 1,364 feet (PADCNr 2012).

The topography across the area is generally characterized by northeastward trenching ridges and parallel valley features with interspersed lakes. Elevations range from approximately 500 feet above mean sea level (AMSL) to about 1,000 feet AMSL (USGS 2012).

The topography of the New Jersey Highlands is the result stream erosion due to the structure and lithologic character of the bedrock. However, topography also reflects Pleistocene glaciation. A terminal moraine of the Wisconsinan glaciation is situated in the central portion of Morris County, New Jersey. This moraine forms a belt, which is approximately 2 to 3 miles wide and roughly parallel to the Rockaway River (CRA 2010). North of the moraine, the topography reflects terrain typically associated with glacial outwash valleys filled with alluvium and sparse rock exposures.

The geology of the region is very complex. A rugged topography and the surficial bedrock exposures partially reveal the chaotic structure of the region, although the true character of the subsurface is difficult to determine. It is believed that a series of gently eastward dipping thrust faults occur in the region due to compression-style deformation during the Acadian and Alleghenian

3 Physical Characteristics of the Study Area

Orogenies and extension-style deformation during the development of the Early Mesozoic rift basins played a role (USGS 2012).

Three geologic units are found at the Site: glacial overburden, saprolite, and bedrock. The overburden is up to 20 feet thick. It is described as an unstratified sandy loam deposit composed of brown sand with some silt along with little clay and gravel, and occasional boulders (USDA 2010). The overburden is underlain by extremely weathered bedrock called saprolite. This chemically weathered bedrock which maintains the structure of the original rock is found between the overburden and bedrock and is generally up to 22 feet thick (Sims and Buddington 1958; USDA 1976). Bedrock at the site consists of a wide variety of igneous rocks, migmatites, and intrusive igneous rocks. It is primarily Precambrian age medium- to coarse-grained granitic gneiss. It is generally massive, dense, and moderately fractured (Sims and Buddington 1958; USDA 1976).

3.1.2 Hydrogeology

There are two aquifers beneath the Site that are separated by the northeast/southwest bedrock ridge along Lake Denmark Road. West of the ridge, groundwater flows toward Lake Denmark in all the geologic units. East of the ridge, groundwater flows toward a low-lying center before flowing off-site to the south (CRA 2010). In this eastern portion, groundwater is primarily found within bedrock. Groundwater flow is reflective of the topography of the region and can flow radially from topographic highs, such as that which has been observed in the P2 Area (CRA 2010). The South Stand and East Stand Areas are low lying and represent groundwater recharge areas.

The surficial aquifer is found within the overburden and saprolite units, while the deep groundwater system is found within bedrock. However, these separate aquifers are hydraulically connected. The surficial groundwater system exists primarily in the western portion (RTI Area) of the Site. The surficial system is directly underlain by the deep groundwater system. The deep groundwater system exists across the entire site and at some locations (P2 Area) it is the only system present. Surficial and deep groundwater flows westward in the RTI Area toward Lake Denmark. Lake Denmark appears to be a groundwater discharge source for the saprolite (surficial) and shallow bedrock (deep) groundwater systems (CRA 2010). Based on topography, the deep bedrock groundwater flows in a westward direction, potentially underneath Lake Denmark towards the Picatinny Military Arsenal. The influence of fractures on bedrock groundwater flows become more pronounced with depth. The upper portions of the bedrock have an overall higher permeability due to weathering and erosion (CRA 2010).

Surface Hydrology

Lake Denmark to the west of the Site is a major surface water feature in the vicinity of the project area. Fed by Burnt Meadow Brook, Lake Denmark is a man-made lake that flows into Picatinny Lake and then into the Rockaway River (CRA 2010). Other surface water features exist within the vicinity of the Site as

3 Physical Characteristics of the Study Area

well. Surface waters within the vicinity of the Site are classified as FW2-TM(C1) (freshwater other than Pinelands waters, trout maintenance, Category 1) (NJDEP 2012).

3.1.3 Threatened and Endangered Species

The United States Fish and Wildlife Service (USFWS) Environmental Conservation Online System was searched by E & E for Federally Listed Endangered and Threatened Species for Morris County, New Jersey (USFWS 2013a). Attempts were made to contact the USFWS Morris County, New Jersey field office, no response has been received to date.

The USFWS website was searched for federally listed threatened and endangered species (USFWS 2013b). The Conserve Wildlife Foundation of New Jersey website was searched for New Jersey state threatened and endangered species (CWF 2013). The following are federally listed and state listed species located in Morris County, New Jersey:

Federally-listed species

- Swamp pink (*Helonias bullata*) – Threatened flowering plant species
- Indiana bat (*Myotis sodalist*) – Endangered Mammal
- Bog turtle (*Clemmys muhlenbergii*) – Endangered reptile

State-listed species

Mammals.

- Bobcat (*Felis rufus*) - Endangered
- Eastern Small-footed Myotis (*Myotis leibii*) - Endangered
- Little Brown Bat (*Myotis lucifugus*) - Endangered
- Northern Myotis (*Myotis septentrionalis*) - Endangered
- Tricolored Bat (*Perimyotis subflavus*) - Endangered

Birds.

- American Bittern (*Botaurus lentiginos*) -Endangered
- American Kestrel (*Falco sparverius*) - Threatened
- Bald Eagle (*Haliaeetus leucocephalus*) - Endangered
- Barred Owl (*Strix varia*) - Threatened
- Black-crowned Night Heron (*Nycticorax nycticorax*) - Threatened
- Bobolink (*Dolichonyx oryzivorus*) -Threatened
- Cattle Egret (*Bubulcus ibis*) -Threatened

3 Physical Characteristics of the Study Area

- Golden-winged Warbler (*Vermivora chrysoptera*) - Endangered
- Grasshopper Sparrow (*Ammodramus savannarum*) - Threatened
- Henslow's Sparrow (*Ammodramus henslowii*) - Endangered - Migration
- Horned lark (*Eremophila alpestris*) - Threatened
- Long-eared Owl (*Asio otus*) - Threatened
- Northern Goshawk (*Accipiter gentilis*) - Endangered
- Northern Harrier (*Circus cyaneus*) - Endangered
- Osprey (*Pandion haliaetus*) - Threatened
- Peregrine Falcon (*Falco peregrinus*) - Endangered
- Pied-billed Grebe (*Podilymbus podiceps*) - Endangered
- Red-headed Woodpecker (*Melanerpes erythrocephalus*) - Threatened
- Red-shouldered hawk (*Buteo lineatus*) - Endangered
- Savannah Sparrow (*Passerculus sandwichensis*) - Threatened
- Sedge Wren (*Cistothorus platensis*) - Endangered
- Short-eared Owl (*Asio flammeus*) - Endangered
- Upland Sandpiper (*Bartramia longicauda*) - Endangered
- Vesper Sparrow (*Pooecetes gramineus*) - Endangered
- Yellow-crowned Night Heron (*Nyctanassa violaceus*) - Threatened

Reptiles/Amphibians.

- Timber Rattlesnake (*Crotalus h. horridus*) - Endangered
- Wood Turtle (*Clemmys insculpta*) - Threatened
- Blue-spotted Salamander (*Ambystoma laterale*) - Endangered
- Long-tailed Salamander (*Eurycea l. longicauda*) - Threatened

Mussels.

- Brook Floater (*Alasmidonta varicose*) - Endangered
- Eastern Lampmussel (*Eastern Lampmussel*) - Threatened
- Triangle Floater (*Alasmidonta undulate*) - Threatened

Insects.

- Arogos Skipper (*Atrytone arogos arogos*) - Endangered
- Bronze Copper (*Lycaena hyllus*) - Endangered
- Brook Snaketail (*Ophiogomphus asperses*) - Threatened

3 Physical Characteristics of the Study Area

■ Gray Petaltail (*Tachopteryx thoreyi*) - Endangered

The Mitchell's Satyr (*Neonympha mitchellii mitchellii*) - Endangered was both on the federal and state list. However, it has been extirpated in New Jersey, therefore, it is not included on either list (USFWS 2013b; CWF 2013).

The New Jersey Natural Heritage Database (NJNHD) was also searched by E & E for information on plant species listed in Morris County, New Jersey, as endangered, threatened, or survival in jeopardy, that may occur in the site vicinity (NJNHP 2013). The NJNHD database search results for Morris County, New Jersey, included 64 vascular plants listed as endangered and 68 vascular plants were listed as endangered or threatened. Structures and/or buildings located in OU3 may be demolished or refurbished in the future. Therefore, there could be some limited impact to the natural habitats of the plants listed during potential use of heavy equipment in the area, if the presence of threatened or endangered plants is confirmed. A list of the Rare Plant Species and Ecological Communities Presently Recorded in the NJNHD is included in Appendix E.

3.1.4 Soils

The United States Department of Agriculture (USDA) Web Soil Survey database was searched for soils at the site (USDA 2013). The soils present on-site were classified as five soil series:

- (RobCb) Rockaway Sandy Loam, 8 to 15% slopes, very stony;
- (HhmCa) Hibernia Loam, 3 to 15% slopes, stony;
- (RobDc) Rockaway Sandy Loam, 15 to 25% slopes, extremely stony;
- (RNRE) Rock Outcrop-Rockaway Complex, 15 to 35% slopes; and
- (RkgBc) Ridgebury Loam, 0 to 18% slopes, extremely stony.

3.1.5 Floodplains

The Federal Emergency Management Agency (FEMA) delineates the regulatory 100-year and 500-year floodplain for use in the National Flood Insurance Program. The FEMA 100-year and 500-year floodplain maps (dated September 18, 1986) were reviewed and concluded that the site is located in Zone C, which includes areas of minimal flooding, and Zone D, which includes areas of undetermined, but possible, flood hazards (FEMA 2013).

3.1.6 Surface Water

Regionally, surface water in Morris County consists of several lakes and ponds. The closest sizable surface waterbodies within a 1-mile radius of the site are Lake Denmark (approximately 0.15 miles north of the site); Hudsonia Pond (approximately 0.20 miles south of the site); Lake Telemark, and Lake Ames (approximately 0.45 miles and 0.80 miles southwest of the site, respectively; see Figure 1-1).

3 Physical Characteristics of the Study Area

There are a few marsh areas, streams, and standing water within the site investigation area. Marsh areas are located in the East Stand Area: west of the Water Cooling Tower, east of the Effluent Treatment Basin, and north of the dirt road separating the East and South Stand Areas. The elevation in this area ranges from approximately 840 to 865 feet AMSL. Marsh areas, streams, and water bodies are also located in the ravine in the South Stand Area: east of all the structures/buildings, and south of the dirt road separating the East and South Stand Areas. The elevation in this area ranges from approximately 800 to 845 feet AMSL.

The majority of the site surface is unpaved, although there are some concrete surface areas that have current/former buildings and structures on them. Surface runoff could be considered a pathway for off-site migration of contaminants in OU3. No on-site dry wells and/or leach pools were observed on-site to collect storm water, which would decrease the amount of infiltration of storm water into subsurface soils and the underlying aquifer.

3.1.7 Cultural Resources and Historic Properties

Cultural resources typically consist of architectural or built resources (buildings and structures) and archaeological resources (prehistoric and historic archaeological sites) associated with the cultural context and/or history of a project area. Historic properties are those cultural resources that have been evaluated for National Register eligibility in accordance with 36 CFR Part 60, and included in or determined eligible for inclusion in, the NRHP (Advisory Council on Historic Preservation [ACHP] 2004; U.S. Department of the Interior 1995).

Cultural resource investigations conducted for the RI consisted of an NRHP-eligibility evaluation of the structures and buildings (see Appendix A for a list of structures and buildings) located on the property to determine whether they were NRHP-eligible in 2012. Because the RI did not involve ground disturbance, no archaeological investigations were conducted.

Based on the results of the NRHP-eligibility evaluation study, Hartgen recommended that none of the structures and buildings included in the RI would be individually NRHP-eligible. However, Hartgen has found that these structures and buildings would collectively represent contributing elements of a single NRHP-eligible historic district. Hartgen has called this potential historic district the Reaction Motors Lake Denmark Historic District, and has suggested its boundaries as contiguous with the boundaries of the RTI property (see Appendix A).

Hartgen has concluded that the potential Reaction Motors Lake Denmark Historic district would be NRHP-eligible under Criteria A and D and under Criteria Consideration G (NPS 1997) because of its significance in the areas of the Cold War and the U.S. Space Program (Space Race). Hartgen has recommended that the period of significance for the potential historic district is from 1949 to 1972, when Reaction Motors, Inc., occupied the site (see Appendix A).

3 Physical Characteristics of the Study Area

Hartgen has concluded that the potential historic district would be eligible under Criterion A as a reflection of the historic importance of the activities conducted on the site. Work on the site was crucial to American defense and the development of the space program. The potential historic district would be eligible under Criterion D for the research value presented by the facility. The potential historic district would be eligible under Criteria Consideration G because it has achieved significance within the last 50 years, due to activities associated with the U.S. Space Program and Cold War (see Appendix A).

Hartgen has concluded that the existing structures and buildings at the site collectively convey a sense of the sites significance due to the activities of Reaction Motors as part of its role in the early twentieth century experimentation with and development of rocket fuel and reaction motor technologies and the development and testing of the Bullpup rocket, Viking, and X-15 experimental rocket plane on the site. With the destruction of other facilities that could have conveyed a similar story and had similar research potential, the Reaction Motors site at Lake Denmark has gained importance as one of the few remaining sites that document this period of American history (see Appendix A).

Hartgen noted that additional structures, buildings, and other built resources, such as roads, berms, and other hardscaping and landscaping features, are within the proposed boundaries of the historic district but were not evaluated for the RI (see Appendix A). Additionally, Cultural Resources Consulting Group conducted a Phase IA cultural resource reconnaissance for the RTI property in 2007 and noted that, in addition to buildings and structures that may be NRHP-eligible, the RTI property may contain archaeologically sensitive areas that could contain previously unidentified archaeological sites, including archaeological resources that could be associated with the industrial nature of the potential historic district (Woodhouse-Beyer et al 2007).

4

Nature and Extent of Contamination

4.1 Introduction

This section presents results of samples collected during the field investigation conducted on April 22 through 26, 2013, at the Radiation Technology Superfund Site in OU3. Section 6 provides recommendations for buildings/structures with exceedances to either NJDEP Residential Direct Contact Health Based Screening Criteria and Soil Remediation Standards (RDCSRS) or Non-RDCSRS.

4.1.1 Screening

The analytical results (see Tables 4-1 through 4-6) were screened to identify samples and analyte levels that may represent a possible threat to human health and/or the environment. For screening purposes, concrete, cinder block, caulk, oil, and soil samples were compared with the May 7, 2012, RDCSRS and Non-RDCSRS. The RDCSRS are referred to in the NJDEP Solid and Hazardous Waste Management Program Guidance for Characterization of Concrete and Clean Material Certification for Recycling (NJDEP 2010). The Non-RDCSRS was also used for additional evaluation in case the RDCSRS were exceeded. The NJDEP remediation standards do not have a screening level for perchlorate. Therefore, the May 2013 EPA Regional Screening levels for Soil (Residential and Industrial) for perchlorate were used. The NJDEP remediation standards do not have a screening level for chromium. However, chromium III was used as a surrogate in the risk screening (Section 5). Water samples were compared to NJDEP Surface Water Quality Standards, Surface Water Quality for Toxic Substances (Fresh Water [FW2] Criteria).

Total concentrations for the 16 Target Compound List (TCL) PAHs in the SVOCs analysis and for the individual Aroclors in the PCB analysis were calculated based on the total of detected compounds only. The total concentrations are reported on the summary tables in addition to the individual compounds. Several tentatively identified compounds (TICs) were reported by the CLP laboratories for the volatiles and SVOCs. These results were not validated. A summary of the TICs is provided in Appendix B of the QCSR (see Appendix C). Tables 4-1 through 4-3 include a Summary of Analytical Results for the P2 Area, South Stand Area, and East Stand Area for concrete, cinder block, and caulk samples. Table 4-4 includes a Summary of Analytical Results for tank samples. Table 4-5 includes a

4 Nature and Extent of Contamination

Summary of Analytical Results for water samples. Table 4-6 includes a Summary of Analytical Results for Soil Samples.

4.1.2 Contaminant Figures

Figures 2-1 through 2-25 include the sample locations collected in April 2013 and locations with planned samples that were not collected. Figures 4-1 through 4-10 include sample locations with contained concentrations that exceeded their respective screening standards. ACM and LBP findings are included in Appendix B.

4.1.3 Quality Assurance/Quality Control

The QCSR included in Appendix C presents a summary of the QA/QC measures implemented as part of the data collection program as designated in the UFP QAPP (E & E 2013a). Samples were collected and analyzed as specified in the QAPP/FSP with minor deviations noted in the QCSR. The following analytical issues may have an impact on the usability of the data:

- Method blanks contained lows of several metals, primarily selenium and cobalt; SVOCs primarily polynuclear aromatic hydrocarbons (PAHs) and phthalates; and VOCs primarily common laboratory solvents, such as acetone and methylene chloride. Low levels of these compounds in the samples were flagged as non-detect and the results elevated to the quantitation limit. Therefore, the data cannot be used to elevate trace levels of many contaminants. In general, the screening criteria are above the reported quantitation limits and data can be used to compare to screening criteria.
- Overall the usability of the data for pesticides particularly dichlorodiphenyltrichloroethane DDT compounds, dieldrin, and gamma-chlordane are limited because the results could not be confirmed or were rejected due to analysis issues. The qualifications suggest that many of the reported pesticide values were due to the presence of the interferences and not actual presence of the pesticide. Since the samples were primarily building materials this is not unexpected. The data cannot be used to determine low concentrations of pesticides in samples. Since the screening criteria levels are well above the quantitation limit for most pesticides there is no impact on the usability of the data to compare to screening criteria for disposal or risk assessment purposes.

Some of the field duplicate results show poor precision for perchlorate especially at low concentrations. Results at lower concentrations are expected to have higher variability. Any statistical evaluation of perchlorate results at low levels should be considered to have a high variability.

4.2 P2 Area Sample Results

A total of four buildings/structures (R-47, Paint Locker, Acid [Oxidizer] Storage Tank, and R-34) were sampled in the P2 Area and are summarized below.

4.2.1 R-47

R-47 is a building which currently contains oil staining in the southern portion where drums were located, and an AST is located outside the west end of the building. Debris located inside R-47 includes: wood framing, several old tires, wood debris, metal shelf, desks, frames, metal containers, plastic boxes for sample cores/sample cores on the ground, buckets, insulation, empty plastic containers, and bags of concrete.

Proposed samples from the FSP (R47-AST-01 and R47-UST-01) were not collected. The AST at R-47 was dry, therefore, no sample was collected. No UST was found at R-47 during digging and magnetometer search activities, therefore, no sample was collected (see Section 2.3.2).

4.2.1.1 Concrete Samples

Two concrete samples (R47-CON-01 and R47-CON-02) were collected at R-47 in the cracked and stained concrete floor, respectively. A duplicate sample (R47-CON-R7) was also collected while sampling R47-CON-01 (see Figure 4-1). Table 4-1 includes a Summary of Analytical Results for the P2 Area.

SVOCs

No SVOCs were detected at concentrations exceeding their respective screening standards.

Phthalates were the primary contaminants detected at R47-CON-01 with concentrations ranging from 28 milligrams per kilogram (mg/kg) to below 0.23 J mg/kg. Trace levels of PAHs also were detected in R47-CON-01 but the PAHs were not found at the same levels in the duplicate sample R47-CON-R7. Most SVOCs were not detected in R47-CON-02, however, dimethylphthalate and total PAHs were detected at 0.087 J mg/kg and 0.152 mg/kg, respectively. Neither dimethylphthalate nor total PAHs have screening standards. Individual PAHs include phenanthrene detected in R47-CON-01 at 0.33 J mg/kg and in R47-CON-02 at 0.14 J mg/kg. Both concentrations were below the screening standard for Non-RDCSRS. Phenanthrene does not have a screening standard for RDCSRS.

TAL Metals

Samples R47-CON-01, R47-CON-02, and duplicate sample R47-CON-R7 (for R47-CON-01) had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

All concrete samples for this building contained concentrations exceeding both the RDCSRS and Non-RDCSRS screening standards. Total PCBs were detected in R47-CON-01 at 680 mg/kg and R47-CON-02 at 7.1 mg/kg.

Perchlorate

None of the samples had concentrations for perchlorate that exceeded their respective screening standards.

Pesticides

All of the concrete samples had at least one pesticide concentration that exceeded the RDCSRS and Non-RDCSRS screening standards. The high levels of pesticides may be a result of interferences from the relatively high concentrations of PCBs in these samples.

Several pesticides were detected at relatively high concentrations in samples R47-CON-01 and the duplicate sample at this location. Pesticides were found at much lower concentrations in R47-CON-02.

- Pesticide 4,4'-Dichlorodiphenyldichloroethylene (DDE) was detected at a concentration of 3.8 J mg/kg in R47-CON-01. The sample exceeded the RDCSRS screening standard.
- Dieldrin was detected at a concentration of 4.4 J mg/kg in R47-CON-01. The sample exceeded the RDCSRS and Non-RDCSRS screening standards. Dieldrin was also detected at a concentration of 0.11 J mg/kg in R47-CON-02, which exceeded the RDCSRS screening standard.
- Gamma-BHC (Lindane) was detected at a concentration of 0.79 mg/kg in duplicate sample R47-CON-R7 (for R47-CON-01). The sample exceeded the RDCSRS screening standard.
- Gamma-chlordane was detected at a concentration of 3.7 NJ mg/kg in R47-CON-01. The sample exceeded the RDCSRS and Non-RDCSRS screening standards.

4.2.1.2 Cinder Block Sample

One cinder block sample (R47-CBK-01) was collected at R-47 approximately 4 feet above the floor from a wall located inside the west side of the building.

Table 4-1 includes a summary of analytical results for the P2 Area.

SVOCs

No SVOCs were detected at concentrations exceeding their respective screening standards.

Trace levels of PAHs and one phthalate was detected in R47-CBK-01. The total PAH concentration is 0.045 mg/kg. There is no screening standard for total PAHs. Individual PAH detections include phenanthrene at 0.024 J mg/kg, which is below the Non-RDCSRS. Phenanthrene does not have a screening standard for RDCSRS. Several PCBs were detected as TICs for duplicate sample R47-CON-R7 (see Table B-1 in the QCSR; see Appendix C). The PCBs were not reported in the original samples because it was run at a higher dilution and the reporting limits were higher than the duplicate analysis.

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TAL Metals

Arsenic and lead had concentration of 96.4 mg/kg and 1,410 mg/kg, respectively. These concentrations exceed both the RDCSRS and Non-RDCSRS screening standards. Manganese was also detected at a concentration of 12,800 mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standards. The sample also had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards.

PCBs

Total PCBs were detected at a concentration of 1.8 mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standards.

Perchlorate

The sample did not have a concentration for perchlorate that exceeded the respective screening standards.

Pesticides

The sample did not have concentrations for pesticides that exceeded the respective screening standards. Delta-BHC had a concentration of 0.007 J mg/kg, there is no screening standard for this pesticide.

4.2.1.3 R-47 Sample Results Summary

The highest exceedances detected in the R-47 concrete samples were for total PCBs followed by pesticides. Pesticide exceedances may be due to interference from the high concentration of PCBs. The R47-CON-01 sample had the highest exceedances for both contaminants. The R47-CON-01 sample was collected in the former spray paint booth/drying oven area from a crack in the concrete (see Figure 2-1). High levels of phthalates also were found in this sample but the concentrations did not exceed screening criteria. The highest exceedance in the R-47 cinder block sample was for TAL metals followed by total PCBs. The R47-CBK-01 sample was collected from an interior cinder block wall located in the center of the building approximately 4 feet above the floor.

4.2.2 Paint Locker Samples

The Paint Locker is a cinder block building which is filled with debris. The area near the southern entrance was manually cleared prior to selecting a concrete sample location. Debris located inside the Paint Locker includes: Rad Nuts™, wood boxes, metal containers, and cardboard boxes.

4.2.2.1 Concrete Sample

One concrete sample (Paint Locker-CON-01) was collected at the Paint Locker inside the southern portion of the building (see Figure 4-2). Table 4-1 includes a summary of analytical results for the P2 Area.

SVOCs

No SVOCs were detected at concentrations exceeding their respective screening standards. Phthalates were the primary contaminants detected but at

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concentrations below the screening criteria. Dimethylphthalate had a concentration of 1.3 mg/kg and there is no screening standard for dimethylphthalate.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

The sample did not have a concentration for total PCBs that exceeded the respective screening standards.

Perchlorate

The sample did not have a concentration for perchlorate that exceeded the respective screening standards.

Pesticides

The only pesticide detected in the sample was 4,4'-DDE and the concentration did not exceed the respective screening standards.

4.2.2.2 Cinder Block Sample

One cinder block sample (Paint Locker-CBK-01) was collected at the Paint Locker in the west wall of the building approximately 3.5 feet above the floor. Table 4-1 includes a summary of analytical results for the P2 Area.

SVOCs

PAHs were the primary contaminants detected.

- Benzo(a)anthracene was detected at a concentration of 0.79 mg/kg, which exceeds the RDCSRS screening standard. Benzo(a)pyrene was also detected at a concentration of 0.3 J, which exceeds both the RDCSRS and Non-RDCSRS screening standards.
- Acenaphthylene and phenanthrene were detected at concentrations of 0.021 J mg/kg and 0.22 mg/kg, respectively. Both concentrations are below the Non-RDCSRS screening standard. Neither acenaphthylene nor phenanthrene has a screening standard for RDCSRS.
- The total PAHs concentration is 8.092 mg/kg, however, total PAHs does not have a screening standard for RDCSRS or Non-RDCSRS. Several methylated PAHs were detected as TICs (see Table B-1 in the QCSR; see Appendix C).

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. For the remaining

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detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

The sample did not have a concentration for total PCBs that exceeded the screening standards.

Perchlorate

The sample did not have a concentration for perchlorate that exceeded the respective screening standards.

Pesticides

No pesticides were detected in the cinder block sample.

4.2.2.3 Caulk Sample

One caulk sample (Paint Locker-CAULK-01) was collected at the Paint Locker from the exterior door frame at the north end of the building. Per the NJDEP Solid and Hazardous Waste Management Program Guidance for Characterization of Concrete and Clean Material Certification for Recycling document (NJDEP 2010), the sample was analyzed for PCBs and SVOCs (which includes PAHs). This sample was not analyzed for perchlorate, TAL metals, or pesticides. Table 4-1 includes a summary of analytical results for the P2 Area.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Only trace levels of PAHs and one phthalate was detected. Individual PAH detections include phenanthrene detected at a concentration of 0.014 J mg/kg, which is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS. The total PAHs concentration is 0.026 J mg/kg, however, total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

PCBs

Total PCBs were detected at a concentration of 2 mg/kg, which exceeds both the RDCSRS and Non-RDCSRS screening standard.

4.2.2.4 Paint Locker Sample Results Summary

Both the SVOC and total PCB concentrations were slightly above the screening standards. The highest exceedance detected in the Paint Locker cinder block sample was for SVOCs. The highest exceedance detected in the caulk sample was for total PCBs.

4.2.3 Acid (Oxidizer) Storage Tank

The Acid (Oxidizer) Storage Tank currently contains two former tank stands with exposed concrete bases. Several feet of dirt, debris, and brush, exist on top of the former tank stands, which makes it difficult to determine what lies beneath it. There is also a cinder block wall surrounding the tank stands on three sides.

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Debris at the Acid (Oxidizer) Storage Tank includes a tire and metal framing debris located on top of soil/leaves.

4.2.3.1 Concrete Samples

Two concrete samples (ACID/OX-CON-01 and ACID/OX-CON-02) were collected at the Acid (Oxidizer) Storage Tank, 6 inches to 1 foot south of the concrete blocks (see Figure 2-3). Table 4-1 includes a summary of analytical results for the P2 Area.

SVOCs

None of the concentrations exceeded the screening standards. A trace level of one phthalate in sample ACID/OX-CON-01 was the only SVOC detected.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum had detections which were below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

None of the concentrations exceeded the screening standards. PCBs were only detected in ACID/OX-CON-01.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

None of the concentrations exceeded the screening standards. Three pesticides were detected in ACID/OX-CON-01.

4.2.3.2 Acid (Oxidizer) Storage Tank Sample Results Summary

None of the concrete sample results contained concentrations that exceeded their respective screening standards.

4.2.4 R-34

R-34 is a building that currently contains debris: wood; metal from doors; plastic/tubing pieces; wood pallets; cinder blocks; Rad Nuts™; wood flooring tiles; an old heater; electrical panels; an AST; empty 55-gallon drums; and an old computer. There are floor drains and a wall mounted transformer containing oil located inside the building.

4.2.4.1 Concrete Samples

Two concrete samples (R34-CON-01 and R34-CON-02 [and the R34-CON-02 duplicate sample R34-CON-R6]) were collected inside the building near a floor

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drain and inside a former welding room, respectively (see Figure 4-3). Table 4-1 includes a summary of analytical results for the P2 Area.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Trace levels of PAHs and a few other SVOCs were detected in R34-CON-01 and in duplicate sample R34-CON-R6 (for R34-CON-02). No SVOCs were detected in R34-CON-02. Dibenzofuran and phenanthrene were detected in R34-CON-01. There are no screening standards for dibenzofuran. The phenanthrene concentration was below the screening standard for Non-RDCSRS, there is no RDCSRS screening standard for phenanthrene.

TAL Metals

Antimony was detected in duplicate sample R34-CON-R6 at a concentration of 57.5 J mg/kg, which exceeds the RDCSRS screening standard. In addition, calcium, chromium, iron, magnesium, and potassium were detected in the sample. None of these analytes have screening standards. Aluminum also had detections which were below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

Total PCBs were detected in R34-CON-01 at a concentration of 0.2 mg/kg, which exceeds the RDCSRS screening standard. PCB concentrations in the duplicate sample of R34-CON-02 did not exceed screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

None of the pesticides were detected at a concentration that exceeded their respective screening standards. Trace levels of pesticides were detected in all three samples but values were not confirmed or rejected.

4.2.4.2 Cinder Block Sample

One cinder block sample (R34-CBK-01) was collected inside R-34 in the southern portion of the building approximately 3.5 feet above the floor. Table 4-1 includes a summary of analytical results for the P2 Area.

SVOCs

None of the SVOCs had concentrations exceeding their respective screening standards. Trace levels of PAHs and phthalates were detected in the sample. However, phenanthrene was detected at a concentration below the screening standard for Non-RDCSRS, there is no RDCSRS screening standard for

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phenanthrene. Total PAHs were also detected in the sample at a concentration of 0.288 mg/kg, but there are no screening standards for total PAHs.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum also had detections which were below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

Total PCBs were detected at a concentration of 0.23 mg/kg which exceeds the RDCSRS screening standard.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

None of the pesticides were detected at a concentration that exceeded their respective screening standards. Trace levels of pesticides were detected but values were not confirmed.

4.2.4.3 Oil Sample

One oil sample (R34-Oil-01) was collected inside R-34 from a wall mounted transformer which contained approximately 2 inches of oil inside the (1 foot by 1 foot by 4 feet) transformer (see the Photo Log in Appendix D). The sample was analyzed for lead, PCBs, and DRO/GRO. The results are presented on Table 4-4.

Lead

Lead was not detected at a concentration that exceeded the screening standards.

PCBs

Total PCBs were detected at a concentration of 55 J mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standards.

DRO/GRO

Motor oils were detected at a concentration of 560,000 J mg/kg and petroleum hydrocarbons C10-C28 were detected at a concentration of 1,100,000 J mg/kg. There are no screening standards for DRO/GRO.

4.2.4.4 R-34 Sample Results Summary

The highest exceedance detected in the R-34 concrete samples was antimony (only for RDCSRS) and total PCBs. The only exceedance detected in the cinder block sample was for total PCBs. Both total PCB concentrations were either the same as the screening standard or slightly above. The oil in the wall mounted

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transformer did contain concentrations of PCBs, motor oils, and petroleum hydrocarbons C10-C28, which confirmed it was oil.

4.3 South Stand Area Sample Results

A total of eight buildings/structures (Test Stand 12 [S-12]; S-46; Test Stand 11 [S-11]; Test Stand 37 [S-37]; No. 1 Sewage Treatment Plant; S-48; T-50; and S-49) were sampled in the South Stand Area and are summarized below. A summary of analytical results for these samples and a comparison with the screening standards is presented in Table 4-2 for the South Stand Area.

4.3.1 Test Stand 12 (S-12)

S-12 is a test stand with three bays and an interior area (internal control rooms) located in the side of a hill (see Figure 4-4). Debris inside S-12 includes: sheet of wood and boards; a bucket; and approximately 60 tires. Debris outside of S-12 includes: tires; wood; hose; and bricks. The middle bay has a pile of debris approximately 10 feet in height.

4.3.1.1 Concrete Samples

Two concrete samples (S12-CON-01 and S12-CON-02) were collected outside S12 in the westernmost bay and inside (possible former control room) near a floor drain, respectively (see Figure 4-4). Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

None of the individual PAHs had concentrations exceeding their respective screening standards. The only SVOCs detected in the samples were trace levels of PAH. There are no screening standards for total PAHs.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum also had detections which were below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

Total PCBs were detected at a concentration of 1.3 mg/kg in S12-CON-02, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

None of the pesticides were detected at a concentration that exceeded their respective screening standards. Trace levels of pesticides were detected only in

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S12-CON-02 but several values were not confirmed. The detections may be due to interference from the PCBs found in this sample.

4.3.1.2 Caulk Sample

One caulk sample (S12-CAULK-01) was collected from the door frame at S12 located on the west side of the building. Per the NJDEP Solid and Hazardous Waste Management Program Guidance for Characterization of Concrete and Clean Material Certification for Recycling document (NJDEP 2010), the sample was analyzed for PCBs and SVOCs (which includes PAHs). This sample was not analyzed for perchlorate, TAL metals, or pesticides. Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

Phenanthrene was the only SVOCs detected at a concentration of 0.028 J mg/kg, which is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.

PCBs

Total PCBs were detected at a concentration of 49 mg/kg, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

4.3.1.3 S-12 Sample Results Summary

The only exceedances for the concrete and caulk samples collected from S-12 were for total PCBs. Both of the samples with exceedances were collected from the internal control room area.

4.3.2 S-46

S-46 is a building which currently contains the following debris: lawnmowers; a desk; office supplies; plastic pieces; motors; empty oil/gasoline cans; cardboard boxes; wood pallets; dust/leaf blowers; metal brushes; buckets; 30-gallon solid drum not labeled; jars and plastic bottles; tires; a plastic tarp; fluorescent light/bulbs; metal pipes; metal work bench; and an eyewash stand. Most of the debris is located in the east room. Overhead pipe insulation containing asbestos was observed on the floor in the west room.

4.3.2.1 Concrete Samples

Two concrete samples (S46-CON-01 and S46-CON-02) were collected inside S46 near a floor drain and cracks in the concrete. Asbestos was observed on the floor, therefore a respirator, TyvekTM suit, and booties were worn during sampling activities by E & E (see Figure 4-5). Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Trace levels of PAHs and phthalates were detected in S46-CON-02 and only one phthalate was detected in S46-CON-01. Both samples were analyzed at with elevated detection limits. However,

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phenanthrene was detected at a concentration of 0.2 J mg/kg, which is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS. The total PAHs concentration in S46-CON-02 was 0.92 mg/kg, total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum also had detections which were below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

Total PCBs were detected at a concentration of 65 J mg/kg in both concrete samples, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Dieldrin was detected at a concentration of 2.7 NJ mg/kg and 2 NJ mg/kg in samples S46-CON-01 and S46-CON-02, respectively. These concentrations exceeded both the RDCSRS and Non-RDCSRS screening standards but the values are not confirmed. Gamma-chlordane was also detected in sample S46-CON-01 at a concentration of 3.6 mg/kg which exceeded both screening standards. The result for S46-CON-02 was rejected. Non-detect values for these samples were rejected due to analytical issues most likely caused by the high concentration of PCBs in the samples.

4.3.2.2 Cinder Block Sample

One cinder block sample (S46-CBK-01) was collected from a wall of the westernmost room located inside the building approximately 4.5 feet above the floor. Asbestos was observed on the floor, therefore a respirator, Tyvek™ suit, and booties were worn during sampling activities by E & E. Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

Trace levels of PAHs and phthalates were detected, but did not exceed their respective screening standards.

- Phenanthrene was detected at a concentration of 0.029 J mg/kg, which is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.

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- The total PAHs concentration was 0.321 J mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.
- Dibenzofuran was detected at a concentration of 0.005 J mg/kg, but dibenzofuran does not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum also had detections which were below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

Total PCBs were detected at a concentration of 0.64 mg/kg, which exceeds the RDCSRS screening standard.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Three pesticides were detected at concentrations that did not exceed their respective screening standards.

4.3.2.3 Caulk Sample

One caulk sample (S46-CAULK-01) was collected from a door frame located on the western side of the building and from several window frames located throughout the building. Per the NJDEP Solid and Hazardous Waste Management Program Guidance for Characterization of Concrete and Clean Material Certification for Recycling document (NJDEP 2010), the sample was analyzed for PCBs and SVOCs (which includes PAHs). This sample was not analyzed for perchlorate, TAL metals, or pesticides. Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

Trace levels of PAHs and phthalates were detected but were below their respective screening standards.

- Phenanthrene was detected at a concentration of 0.03 J mg/kg, which is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.
- Total PAHs concentration was 0.054 mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

PCBs

Total PCBs were detected at a concentration of 0.5 mg/kg, which exceeds the RDCSRS screening standard.

4.3.2.4 S-46 Sample Results Summary

Samples collected from S-46 exceeded their respective screening criteria for total PCBs (concrete, cinder block, and caulk samples) and pesticides (concrete samples only). The highest concentration for total PCBs was from the two concrete samples, both were at 65 J mg/kg.

4.3.3 Test Stand 11 (S-11)

S-11 is a test stand with four bays and minimal debris. S-11 does not contain an interior area. North of the bays, there are four pipes extending approximately 3 feet above the ground surface in an area that may have been used for storage/tanks. There is a cinder block wall beyond this area but does not extend around the bays. The northern portion of S-11 is overgrown with organic debris and vines.

4.3.3.1 Concrete Samples

Two concrete samples (S11-CON-01 [and duplicate S11-CON-R4 of S11-CON-01] and S11-CON-02) were collected from the floor of an outside bay and from the wall of a bay (see Figure 2-7). Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Trace levels of PAHs were detected in S11-CON-01 and duplicate S11-CON-R4 (of S11-CON-01), and one phthalate was detected in sample S12-CON-02.

- Phenanthrene was detected in duplicate sample S11-CON-R4 (of S11-CON-01) at a concentration of 0.039 J mg/kg. The concentration is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.
- Total PAHs concentrations in duplicate sample S11-CON-R4 (of S11-CON-01) was 0.681 J mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

All of the samples had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was detected in all the samples and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were not detected in the concrete samples.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were not detected in the concrete samples.

4.3.3.2 Cinder Block Sample

One cinder block sample (S11-CBK-01) was collected from a wall approximately 2.5 feet above the ground. It is located near a possible former storage area north of the rocket motor test bays. Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

None of the concentrations exceeded the screening standards. Only two PAHs were detected in S11-CBK-01, fluoranthene and phenanthrene.

- Fluoranthene was detected at a concentration below the screening standards.
- Phenanthrene was detected in S11-CBK-01 at a concentration of 0.004 J mg/kg, which is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.
- Total PAHs concentration was 0.009 J mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were not detected in the sample.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were not detected in the sample.

4.3.3.3 S-11 Sample Results Summary

None of the samples had concentrations that exceeded their respective screening standards.

4.3.4 Test Stand 37 (S-37)

S-37 is a test stand with minimal debris. The floor in the bay areas is weathered, with some evidence of discoloration. The northern portion of S-37 is overgrown with organic debris and vines.

4.3.4.1 Concrete Samples

Two concrete samples (S37-CON-01 [and duplicate S37-CON-01-R5 of S37-CON-01] and S37-CON-02) were collected from the floor of an outside bay and from the wall of a bay (see Figure 2-8). Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

Trace levels of PAHs were detected in the duplicate sample but not in the other two concrete samples. Concentrations were below the quantitation limit and none of the SVOCs were detected at a concentration that exceeded their respective screening standards.

- Phenanthrene was detected in duplicate sample S37-CON-R5 (of S37-CON-01) at a concentration of 0.009 J mg/kg, which is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.
- Total PAHs concentration was 0.066 J mg/kg in duplicate sample S37-CON-R5 (of S37-CON-01). Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The samples had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the samples and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were only detected in S37-CON-01 and the duplicate sample (S37-CON-R5). None of the PCB concentrations exceeded their respective screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

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Pesticides

Gamma-chlordane was the only pesticide detected in S37-CON-01 and the duplicate sample (S37-CON-R5), but the concentrations did not exceed the screening standards.

4.3.4.2 Cinder Block Sample

One cinder block sample (S37-CBK-01) was collected from a loose cinder block wall located north of the bays. Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

No SVOCs were detected in the cinder block sample.

TAL Metals

None of the metals had concentrations exceeding their respective screening standards.

PCBs

No PCBs were detected in the sample.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Gamma-chlordane was the only pesticide detected, but the concentration did not exceed the screening standards.

4.3.4.3 S-37 Sample Results Summary

None of the samples had concentrations that exceeded their respective screening standards.

4.3.5 No. 1 Sewage Treatment Plant

4.3.5.1 Water Sample

One water sample (NO1STP-Water-01) was collected from inside the open grated area of the sewage treatment plant which contained 8.10 feet of water, and no sludge (see Figure 2-9). Water parameters that were collected during water sampling are included in Table 2-2. Results are presented on Table 4-5.

VOCs

Carbon disulfide was the only VOCs detected at a concentration of 0.00019 J milligrams per liter (mg/L), but there are no screening standards for this compound.

SVOCs

Butylbenzyl phthalate was the only SVOCs detected at a concentration of 0.00016 J mg/L, which was below the screening standard for this compound.

TAL Metals

The samples had detections for calcium, iron, magnesium, manganese, nickel, potassium, sodium, and zinc. None of these analytes have screening standards. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were not detected in the sample.

Perchlorate

Perchlorate was not detected in the sample.

Pesticides

Pesticides were not detected in the sample.

4.3.5.2 No. 1 Sewage Treatment Plant Sample Results Summary

The sample did not contain concentrations that exceeded their respective screening standards.

4.3.6 S-48**4.3.6.1 Concrete Samples**

Two concrete samples (S48-CON-01 and S48-CON-02 [and duplicate sample S48-CON-R2 of S48-CON-02]) were collected from the S48 concrete pad, which is all that exists at S48. S48-CON-01 was collected from a crack in the concrete pad (see Figure 2-10). Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

None of the concentrations exceeded the screening standards.

- Total PAHs were detected in S48-CON-01 and S48-CON-02, but not the duplicate, at a concentration below the screening standards.
- Fluoranthene was detected in sample S48-CON-01 at a concentration below the screening standards.
- Phenanthrene was detected in sample S48-CON-02 at a concentration of 0.004 J mg/kg, which is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.

TAL Metals

The samples had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the samples and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

Total PCBs were not detected in S48-CON-01 and S48-CON-02. The duplicate sample had a low level total PCB concentration that did not exceed screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

None of the pesticides were detected at a concentration that exceeded their respective screening standards. The duplicate sample S48-CON-R2 had low level concentrations of pesticides.

4.3.6.2 S-48 Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

4.3.7 T-50**4.3.7.1 Concrete Samples**

Two concrete samples (T50-CON-01 and T50-CON-02 [and duplicate sample T50-CON-02-R3]) were collected from the T50 concrete pad, which is all that exists at T50. The concrete pad also contained weathered tile on the top layer (1/8 inch) of the pad and black mastic was observed on the back of the tile by E & E (see Figure 2-11). Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Trace levels of PAHs were detected in all three samples.

- Phenanthrene was detected in sample T50-CON-01 and duplicate sample T50-CON-02-R3 (of T50-CON-02) at concentrations of 0.065 J mg/kg and 0.006 J mg/kg, respectively. These concentrations are below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.
- Total PAHs concentrations in T50-CON-01 and T50-CON-02 were 0.668 J mg/kg and 0.031 J mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The samples had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the samples and was below the RDCSRS screening standard,

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there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were only detected in T50-CON-01, although the PCB concentrations did not exceed screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Two pesticides were detected in T50-CON-01. None of the pesticides were detected at a concentration that exceeded their respective screening standards.

4.3.7.2 T-50 Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

4.3.8 S-49

S-49 consists of two concrete pads. The southern pad is completely covered with water and overgrown with marsh-like vegetation. The northern pad is mostly overgrown with moss; only the northern portion was visible. A dilapidated door frame exists on the south end of the southern pad. There are also dilapidated cinder block walls near the pads which also contained moss.

4.3.8.1 Concrete Sample

One concrete sample (S49-CON-01) was collected from the north end of the northern concrete pad (see Figure 2-12). Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

No SVOCs were detected in the sample.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

No PCBs were detected in the sample.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

No pesticides were detected in the sample.

4.3.8.2 Cinder Block Sample

One cinder block sample (S49-CBK-01) was collected from a dilapidated cinder block wall located approximately 1.5 feet above the ground on the south side of the southern pad. Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

No SVOCs were detected in the sample.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

None of the PCB concentrations exceeded the screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Gamma-chlordane was the only pesticide detected but the concentration did not exceed screening standards.

4.3.8.3 Caulk Sample

One caulk sample (S49-CAULK-01) was collected from a dilapidated door frame located on the south end of the southern pad. Per the NJDEP Solid and Hazardous Waste Management Program Guidance for Characterization of Concrete and Clean Material Certification for Recycling document (NJDEP 2010), the sample was analyzed for PCBs and SVOCs (which includes PAHs). This sample was not analyzed for perchlorate, TAL metals, or pesticides. Table 4-2 includes a summary of analytical results for the South Stand Area.

SVOCs

No SVOCs were detected in the sample.

PCBs

The PCB concentration did not exceed screening standards.

4.3.8.4 S-49 Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

4.4 East Stand Area Sample Results

A total of 13 buildings/structures (Test Stand 2 [R-2]; R-33; R-29; R-21; Test Stand 3 [R-3]; R-51; Test Stand 4 [R-4]; Cistern/Cistern Pump; Scrubber; Water Cooling Tower; Condenser and Hotwell; Water Tower; and Agitator and Effluent Treatment Basin) were sampled in the East Stand Area and are summarized below. A summary of analytical results for these samples and a comparison with their respective screening standards is presented in Tables 4-3 through 4-6.

4.4.1 Test Stand 2 (R-2)

R-2 is a test stand with one bay. There is a large pile of debris located in the bay approximately 20 feet in height. The debris in the pile at R-2 includes: metal; small pieces of concrete; crushed computer parts; broken ceramic pieces; wood; and bikes.

4.4.1.1 Concrete Samples

Two concrete samples (R2-CON-01 and R2-CON-02) were collected from the floor and wall of the bay (4 feet above the ground), respectively (see Figures 2-13 and 4-6). Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Total PAHs were detected in R2-CON-01. Total PAHs concentration was 0.174 mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were detected in sample R2-CON-02 at a total concentration of 0.63 mg/kg which exceeds the RDCSRS screening standard.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Gamma-chlordane was the only pesticide detected in sample R2-CON-02 and the concentration did not exceed screening standards. Several of the pesticide results were rejected.

4.4.1.2 R-2 Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

4.4.2 R-33

R-33 is a small aluminum shed which contains approximately 15 (1-foot by 4-foot) metal grates; wood pallet; and leaves.

4.4.2.1 Concrete Sample

One concrete sample (R33-CON-01) was collected from the floor inside the building (see Figure 2-14). Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

Only one phthalate was detected in the sample, the concentration did not exceed the screening standards.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were detected at low levels and the concentrations did not exceed the screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Only gamma-chlordane was detected but not confirmed, and the concentration did not exceed screening standards. Several of the pesticide results were rejected.

4.4.2.2 Soil Sample

One soil sample (R33-SOIL-01) was collected 1 foot outside the building entrance. Although the soil is not part of the OU3 investigation (not a building/structure), it was sampled due to a previous fire inside the building. The soil sample will determine if any contaminants exist from the fire. The results are presented on Table 4-6.

VOCs

None of the VOCs were detected at a concentration that exceeded their respective screening standards. However, ethylbenzene and isopropylbenzene were detected at concentrations of 0.0034 J mg/kg and 0.00062 J mg/kg, respectively. Neither of these analytes have screening standards.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Total PAHs had a concentration of 0.013 J mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

Perchlorate

Perchlorate was not detected in the sample.

4.4.2.3 R-33 Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

4.4.3 R-29

R-29 is a building which currently contains a plastic bin; wood; paper debris; boxes; and a few taped trash bags filled with unknown items.

4.4.3.1 Concrete Sample

One concrete sample (R29-CON-01) was collected from the northeast portion of the floor located inside the building (see Figure 2-15). Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

SVOCs were not detected in the sample.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were not detected in the sample.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were not detected in the sample and several of the non-detect results were rejected.

4.4.3.2 R-29 Sample Results Summary

The sample did not contain concentrations that exceeded their respective screening standards.

4.4.4 R-21

R-21 is a building that contains miscellaneous debris. The room at the southern corner of the building previously contained approximately 30 drums/containers (55-, 30- and 5-gallon) that were removed by the EPA located in Edison, New Jersey (managed under a different program). During the site visit conducted by E & E and the EPA, it was confirmed that EPA had removed the drums from the room. Debris located in other rooms at R-21 includes: approximately four plastic drum totes/overpack; wood; plastic totes; fallen ceiling tiles; metal water tank; empty metal drum; and broken floor tiles.

4.4.4.1 Concrete Samples

Three concrete samples (R21-CON-01, R21-CON-02, and R21-CON-03) were collected from the floor of the room east of the former drum room, in the center of the floor of the drum room, and next to the floor drain of the drum room, respectively (see Figures 2-16, 2-16a, and 4-7). Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

Benzo(a)anthracene was detected in sample R21-CON-02 at a concentration of 0.7 J mg/kg which exceeds the RDCSRS screening standard. Total PAH concentrations in samples R21-CON-01 and R21-CON-02 were 0.48 mg/kg and 2.66 mg/kg, respectively. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS. No SVOCs were detected in R21-CON-03.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

Total PCBs were detected in sample R21-CON-01 at a concentration of 14 mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standards. PCBs were not detected in the other samples.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Dieldrin was detected in sample R21-CON-01 at a concentration of 0.12 NJ mg/kg which exceeds the RDCSRS screening standard. The result was not confirmed. No pesticides were detected R21-CON-02. No other pesticides were detected at a concentration that exceeded the screening standards.

4.4.4.2 Soil Sample

One soil sample (R21-SOIL-01) and duplicate sample R21-SOIL-R1 (of R21-SOIL-01) were collected from the floor inside the former drum room approximately 6 inches below ground surface (which was below 6 inches of concrete). Although the soil is not part of the OU3 investigation (not a building/structure), it was sampled due to miscellaneous drums previously being stored inside the building and concrete staining observed on the floor. The soil sample will determine if any contaminants exist from the drums and/or staining. The results are reported on Table 4-6.

VOCs

None of the VOCs were detected at a concentration that exceeded their respective screening standards.

- Acetone was detected in sample R21-SOIL-R1 at a concentration of 0.017 mg/kg. This concentration is below the RDCSRS screening standard. Acetone does not have a screening standard for Non-RDCSRS.
- Ethylbenzene was detected in sample R21-SOIL-R1 at a concentration of 0.004 mg/kg.
- Isopropylbenzene was detected in sample R21-SOIL-R1 at a concentration of 0.00078 J mg/kg. Neither of these analytes have screening standards.

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SVOCs

Benzo(a)pyrene was detected in sample R21-SOIL-R1 at a concentration of 0.35 J mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standards.

- Phenanthrene was detected in sample R21-SOIL-01 at a concentration of 0.31 mg/kg. This concentration is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.
- Total PAH concentrations in sample R21-SOIL-R1 was 4.02 mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

4.4.4.3 Caulk Sample

One caulk sample (R21-CAULK-01) was collected from the door frames and window frames throughout the building. Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

Only one phthalate was detected but at a concentration that did not exceed screening standards.

PCBs

PCBs were detected in the sample at a total concentration of 2.1 mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standards.

4.4.4.4 Cinder Block Sample

One cinder block sample (R21-CBK-01) was collected from the wall located inside the former laboratory room approximately 3 feet above the floor. This sample was located on the west side of the building. Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Trace levels of PAHs and one phthalate were detected.

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- Phenanthrene was detected in the sample at a concentration of 0.012 J mg/kg. This concentration is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.
- Total PAHs was detected at a concentration of 0.055 mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were detected in the sample at a total concentration of 0.62 mg/kg which exceeds the RDCSRS but not the Non-RDCSRS screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

None of the pesticides were detected at a concentration that exceeded their respective screening standards.

4.4.4.5 R-21 Sample Results Summary

The highest concentration in the concrete samples was for total PCBs from sample R21-CON-01 at 14 mg/kg, which exceeded both screening standards and was located in the room east of the former drum room. The former drum room only contained one exceedance in the concrete samples (0.7 J for benzo(a)anthracene in sample R21-CON-02) which was only slightly above the RDCSRS screening standard. Total PCBs concentrations with exceedances were for the cinder block and caulk samples. The caulk samples were composited from the door frame of the former drum room in addition to other window and door frames in R-21. The cinder block sample was also composited from cinder block located in various locations of R-21 (not including the former drum room). However, these concentrations were closer to the screening standards than the concrete sample concentrations.

4.4.5 Test Stand 3 (R-3)

R-3 is a test stand with one bay. Minimal debris was observed near the test bay.

4.4.5.1 Concrete Samples

Two concrete samples (R3-CON-01 and R3-CON-02) were collected from the floor and wall (approximately 3 feet above the ground) of the bay (see Figure 2-17). Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

No SVOCs were detected in the samples.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

No PCBs were detected in the samples.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

No pesticides were detected in the samples.

4.4.5.2 Caulk Sample

One caulk sample (R3-CAULK-01) was collected from the door frame located at the northeast corner of the building. Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

No SVOCs were detected in the sample but the quantitation limits were elevated.

PCBs

PCBs were not detected in the sample.

4.4.5.3 R-3 Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

4.4.6 R-51

R-51 is a building with a partially collapsed area/room along the western wall. Debris located inside included: broken glass; wood; fiberglass insulation; particle board walls; and wood framing.

4.4.6.1 Concrete Samples

Two concrete samples (R51-CON-01 and R51-CON-02) were collected from the floor inside the building (see Figure 2-18). Table 4-3 includes a summary of analytical results for the East Stand Area.

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SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. Trace levels of PAHs were detected in R51-CON-01, and phthalates were detected in both samples.

- Phenanthrene was detected in sample R51-CON-01 at a concentration of 0.16 J mg/kg. This concentration is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS.
- Total PAH concentrations in sample R51-CON-01 was at 0.16 mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were detected in both samples, none of the PCB concentrations exceeded screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were not detected at concentrations that exceeded their respective screening standards. Endrin aldehyde was detected at a concentration of 0.023 J mg/kg in sample R51-CON-01. There are no screening standards for endrin aldehyde.

4.4.6.2 R-51 Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

4.4.7 Test Stand 4 (R-4)

R-4 is a test stand with a main testroom, three small testrooms, and two small laboratory rooms. Debris located in the building includes: metal; electrical panels laying on the ground; ceramic pieces; plastic sheeting; wood; fluorescent lights; insulation; ceiling tiles; and pipes.

4.4.7.1 Concrete Samples

Seven concrete samples (R4-CON-01 through R4-CON-07) were collected from the floor of the main testroom, three small testrooms, and two small laboratory rooms located inside the building (see Figures 2-19 and 4-8). The samples were

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collected in cracks in the concrete, stained areas, and downgradient areas of the troughs. Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

Low levels of PAHs were detected in samples R4-CON-01, 05, -06 and -07. SVOCs were not detected in the samples R4-CON-02 and R4-CON-03, but the quantitation limits were elevated in R4-CON-03. Sample R4-CON-04 had elevated quantitation limits for PAHs because phenols were detected at low ppm levels. None of the SVOCs were detected at a concentration that exceeded their respective screening standards. The total PAH concentrations were as follows: R4-CON-01 at 0.008 mg/kg, R4-CON-05 at 0.138 mg/kg, R4-CON-06 at 0.067 mg/kg, and R4-CON-07 at 0.098 mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

Lead was detected in sample R4-CON-01 at a concentration of 406 mg/kg which exceeds the RDCSRS screening standard. The samples also had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the samples and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were detected in samples R4-CON-04 and R4-CON-06 at total concentrations of 0.5 mg/kg and 1.1 mg/kg, respectively. R4-CON-04 exceeded the RDCSRS screening standard and R4-CON-06 exceeded both the RDCSRS and Non-RDCSRS screening standards. PCBs were also detected in samples R4-CON-01, -03 and -05 at total concentrations that did not exceed screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were detected in samples R4-CON-01, -03, -04, -05 and -06. Several of results were rejected. None of the pesticides were detected at a concentration that exceeded their respective screening standards.

4.4.7.2 Cinder Block Sample

One cinder block sample (R4-CBK-01) was collected from the south wall (approximately 4 feet above the floor) located inside the former hallway of the building. Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

Trace levels of PAHs were detected. None of the SVOCs were detected at a concentration that exceeded their respective screening standards. The total PAH concentration in the sample was 0.019 mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were not detected in the sample.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

PCBs were not detected in the sample.

4.4.7.3 R-4 Sample Results Summary

The only exceedance for TAL metals was in R4-CON-01 for lead. This sample was located in the stained area of the floor in the main test room near the overhead door. The only other exceedances were for total PCBs in samples R4-CON-04 and R4-CON-06 which were located in the floor of the small laboratory room and small test room, respectively.

4.4.8 Cistern/Cistern Pump

The Cistern/Cistern Pump is approximately 4 feet 10 inches deep, with a diameter of 6 feet 3 inches. During sampling only 1/8-inch of sediment was located inside the cistern and no sludge was observed. Therefore, no sludge sample was collected.

4.4.8.1 Water Sample

Water sample Cistern-Water-01 and duplicate sample Cistern-Water-R8 were collected from the water located inside the cistern (see Figure 4-9). Water parameters that were collected during water sampling are included in Table 2-2 and sample results are presented in Table 4-5.

VOCs

1,1-Dichloroethane was detected in Cistern-Water-01 at a concentration of 0.00019 J mg/kg. Trans-1,3-Dichloropropene was detected at a concentration of

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0.00018 J mg/L in the sample duplicate. Neither of these compounds have a screening standard.

SVOCs

None of the SVOCs were detected.

TAL Metals

The duplicate sample Cistern-Water-R8 (for Cistern-Water-01) had detections for chromium at 0.0453 J mg/L, which exceeded both the fresh water acute screening standard and the fresh water chronic screening standard. Lead was detected in Sample Cistern-Water-01 at 0.0147 mg/L, which exceeded the fresh water chronic screening standard.

In addition, aluminum, cadmium, calcium, iron, magnesium, manganese, nickel, potassium, sodium, and zinc were detected in both samples. None of these analytes have screening standards. Barium, beryllium, cobalt, copper, and vanadium, were detected in at least one of the samples. None of these metals have screening standards.

PCBs

PCBs were detected in the sample and the duplicate (Cistern-Water-R8) at concentrations of 0.0036 mg/L and 0.0057 mg/L, respectively. The concentrations exceed the fresh water chronic screening standard.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were detected in the duplicate sample (Cistern-Water-R8) but not the original sample (Cistern-Water-01). None of the pesticides were detected at a concentration that exceeded their respective screening standards.

4.4.8.2 Cistern/Cistern Pump Sample Results Summary

Both the sample and the duplicate sample had concentrations that exceeded both the fresh water chronic and acute screening standards for chromium and the fresh water chronic screening standard for lead.

4.4.9 Scrubber

4.4.9.1 Concrete Samples

Two concrete samples (SCRUBBER-CON-01 and SCRUBBER-CON-02) were collected from the upper level and the lower level, respectively (see Figure 2-21). Table 4-3 includes a Summary of Analytical Results for the East Stand Area.

SVOCs

None of the SVOCs were detected at a concentration that exceeded their respective screening standards. SVOCs were detected in SCRUBBER-CON-02

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only. Dimethylphthalate was detected in sample SCRUBBER-CON-02 at a concentration of 0.064 J mg/kg. Dimethylphthalate does not have a screening standard for RDCSRS or Non-RDCSRS. Phenanthrene was detected in sample SCRUBBER-CON-02 at a concentration of 0.017 J mg/kg. This concentration is below the Non-RDCSRS screening standard. Phenanthrene does not have a screening standard for RDCSRS. The total PAH concentration in sample SCRUBBER-CON-02 was 0.028 mg/kg. Total PAHs do not have a screening standard for RDCSRS or Non-RDCSRS.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analytes have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were detected in sample SCRUBBER-CON-02 at a total concentration that did not exceed screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were detected in sample SCRUBBER-CON-02 at concentrations that did not exceed their respective screening standards. Several results were rejected or not confirmed.

4.4.9.2 Scrubber Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

4.4.10 Water Cooling Tower

The Water Cooling Tower currently contains standing water (approximately 6 inches deep) inside the building. A water sample was not collected because no potential sources of contamination were associated with the inside of the building and the water was clearly accumulated rain water that had entered through the open roof of the building. Debris located at the Water Cooling Tower included: wood and a piece of fiberglass.

4.4.10.1 Concrete Sample

One concrete sample (WCT-CON-01) was collected from the southern corner of the outside foundation of the building (see Figure 2-22). Table 4-3 includes a Summary of Analytical Results for the East Stand Area.

SVOCs

Only one phthalate was detected in the sample at a concentration that did not exceed screening standards.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analysts have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were not detected in the sample.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were not detected in the sample.

4.4.10.2 Water Cooling Tower Sample Results Summary

The sample did not contain concentrations that exceeded their respective screening standards.

4.4.11 Condenser and Hotwell**4.4.11.1 Concrete Samples**

Two concrete samples (COND/HW-CON-01 and COND/HW-CON-02) were collected from the floor of the hotwell and condenser, respectively (see Figures 2-23 and 4-10). Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

SVOCs were not detected in the samples.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analysts have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

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PCBs

PCBs were detected in sample COND/HW-CON-02 at a total concentration of 0.21 mg/kg which exceeded the RDCSRS screening standard. PCBs were not detected in COND/HW-CON-01.

Perchlorate

Perchlorate was detected only in COND/HW-CON-01 but at a concentration that did not exceed the screening standards.

Pesticides

Gamma-chlordane was the only pesticide detected in sample COND/HW-CON-02 at a concentration that did not exceed the screening standards.

4.4.11.2 Condenser and Hotwell Sample Results Summary

Only one sample (COND/HW-CON-02) contained a concentration that exceeded the RDCSRS screening standard (total PCBs at 0.21 mg/kg). This sample was located in the floor of the condenser. PCBs were not detected in the other sample.

4.4.12 Water Tower

The total height of the Water Tower (including the legs) is approximately 125 feet (not currently in use). The total height of the water tank (on ground, no legs) located southwest of the tower and is approximately 80 feet. Only the water tank is currently used for fire protection by Sterigenics. An AST and shed are located between the tower and water tank (see Figure 2-24). The results are summarized on Table 4-4.

4.4.12.1 Water Sample

One water sample (WCT-Water-01) was collected from the AST located south of the water tower. There was approximately 9 inches of water/oily liquid in the AST (4 feet by 10 feet) prior to sample collection. No water parameters were collected for this sample since it was a water/oily liquid. Since the liquid separated into two distinct layers (water and oil), it was separated into two samples by the laboratory by decanting the upper layer into separate sample containers (WATERTOWER-AST-01 UPPER PHASE [oily layer] and WATERTOWER-AST-01 LOWER PHASE [water layer]). Both sample phases were analyzed for lead and DRO/GRO.

Lead

Lead was only detected in the upper phase sample at a concentration that did not exceed screening standards.

DRO/GRO

Petroleum hydrocarbons C6-C10 were detected in samples WATERTOWER-AST-01 UPPER PHASE and WATERTOWER-AST-01 LOWER PHASE at a concentration of 28,000 J mg/kg and 350 M mg/kg, respectively. There are no screening standards for petroleum hydrocarbons C6-C10.

4.4.12.2 Water Tower Sample Results Summary

The sample did not contain concentrations that exceeded their respective screening standards. However, the sample contained concentrations of petroleum hydrocarbons C6-C10, which do not have screening standards. The petroleum hydrocarbons C6-C10 and lead results had a higher concentration in the upper phase sample which was mostly oil.

4.4.13 Agitator and Effluent Treatment Basin

The Agitator and Effluent Treatment Basin currently consists of a small shed, and the agitator and effluent treatment basin which has a concrete floor and cinder block wall surrounding it, open to the outside.

4.4.13.1 Concrete Sample

One concrete sample (AGITATOR-CON-01) was collected from the floor (see Figure 2-25). There was approximately 2 inches of standing water during sampling. Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

One PAH (benzo(a)pyrene) and one phthalate were detected in the sample. Neither of the SVOCs were detected at a concentration that exceeded their respective screening standards.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analysts have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were not detected in the sample.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were not detected in the sample.

4.4.13.2 Cinder Block Sample

One cinder block sample (AGITATOR-CBK-01) was collected from the northeast wall of the agitator approximately 3 feet above the ground. Table 4-3 includes a summary of analytical results for the East Stand Area.

SVOCs

SVOCs were not detected in the sample.

TAL Metals

The sample had detections for calcium, chromium, iron, magnesium, potassium, and sodium. None of these analysts have screening standards. Aluminum was also detected in the sample and was below the RDCSRS screening standard, there is no screening standard for Non-RDCSRS. For the remaining detections that have a screening standard, none of them exceeded their respective screening standards.

PCBs

PCBs were not detected at a concentration that exceeded the screening standards.

Perchlorate

Perchlorate was not detected at a concentration that exceeded the screening standards.

Pesticides

Pesticides were not detected in the sample.

4.4.13.3 Agitator and Effluent Treatment Basin Sample Results Summary

The samples did not contain concentrations that exceeded their respective screening standards.

Table 4-1 Summary of Analytical Results for P-2 Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location: R-47													
Sample ID:				Paint Locker				Acid (Oxidizer) Storage Tank					
Date:				Paintlocker-CON-01				Paintlocker-CBK-01				ACID/OX-CON-01	
Date:				Paintlocker-CAULK-01				ACID/OX-CON-02				ACID/OX-CON-02	
Analyte	RDCSRS	Non-RDCSRS	Date:	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013
Perchlorate (mg/kg)													
Perchlorate	55	720		20	0.23 J	14	0.35	0.3	0.012			0.00042 J	0.00068
Total Metals (mg/kg)													
Aluminum	78000			6490	6730	6660	6100	3930	7570			7050	7650
Antimony	31	450		5.9 U	5.8 U	5.9 U	5.9 U	5.8 U	5.9 U			5.8 U	5.9 U
Arsenic	19	19		1.5	1.9	1.5	96.4	3	0.76 J			0.91 J	1
Barium	16000	59000		43.4	38.3	43.8	364	45.4	33.5			33.9	36.7
Beryllium	16	140		0.18 J	0.49 U	0.18 J	2.6	0.49 U	0.5 U			0.49 U	0.49 U
Cadmium	78	78		5.7 J	2.5	1.9 J	2.9	0.15 J	21.3			0.22 J	0.21 J
Calcium				75400	72700	87400	72400	40400	79500			65400	39700
Chromium				142	18.9	89.1	6.7	6.7	31.3			11.6	73.1
Cobalt	1600	590		13.4	6.7	8.6	5.2	3.3 J	8.4			5.9	9.9
Copper	3100	45000		32.1 J	28.7	13.1 J	122	22.3	22.3			16.3	20.7
Iron				13400	12800	11800	14500	9360	12500			10600	12300
Lead	400	800		24	22.3	17.3	1410	19.6	10.2			6.2	6.5
Magnesium				3840	4980	4120	4140	1970	5060			4530	8150
Manganese	11000	5900		194	195	201	12800	146	199			229	164
Nickel	1600	23000		11.8	15.5	8.4	9.5	7.1	11.9			41.4	40.5
Potassium				1830	2160	1250	756	1030	2910			733	4550
Selenium	390	5700		3.4 U	2.1 J	1.7 J	3.4 J	1.9 J	2 J			1.7 J	2.1 J
Silver	390	5700		0.98 U	0.97 U	0.98 U	1.7	0.97 U	0.99 U			0.97 U	0.98 U
Sodium				844	853	603	363 J	273 J	1520			156 J	150 J
Vanadium	78	1100		12.8	16.4	13	12.9	10.2	17.2			15.2	20.8
Zinc	23000	110000		387 J	109	180 J	5040	29	168			64.2	33
Mercury	23	65		0.19	0.048 J	0.16	0.13	0.22	0.14			0.0074 J	0.016 J
Semivolatile Organics (mg/kg)													
1,1'-Biphenyl	3100	34000		1.7 U	0.17 U	0.0053 J	0.17 U	0.17 U	0.17 UJ	0.17 U		0.17 U	0.17 U
2-Methylnaphthalene	230	2400		1.7 U	0.1 J	0.012 J	0.17 U	0.17 U	0.0086 J	0.17 U		0.17 U	0.17 U
4,6-Dinitro-2-methylphenol	6	68		3.3 U	0.33 U	0.33 U	0.065 J	0.33 U	0.33 U	0.33 U		0.33 U	0.33 U
4-Methylphenol	31	340		1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U		0.17 U	0.17 U
Acenaphthylene		300000		1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.021 J	0.17 U		0.17 U	0.17 U
Acetophenone	2	5		0.83 J	0.17 U	0.59	0.17 U	0.17 U	0.17 U	0.17 U		0.17 U	0.17 U
Anthracene	17000	30000		1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.15 J	0.17 U		0.17 U	0.17 U
Benzaldehyde	6100	68000		2.2	0.17 U	1.1	0.17 U	0.17 U	0.17 U	0.17 U		0.17 U	0.17 U
Benzo(a)anthracene	0.6	2		1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.79	0.17 U		0.17 U	0.17 U
Benzo(a)pyrene	0.2	0.2		1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.3 J	0.17 U		0.17 U	0.17 U
Benzo(b)fluoranthene	0.6	2		1.7 U	0.17 U	0.17 U	0.17 U	0.17 UJ	0.42 J	0.17 U		0.17 U	0.17 U
Benzo(g,h,i)perylene	380000	30000		1.7 U	0.17 U	0.17 U	0.17 U	0.17 UJ	0.18	0.17 U		0.17 U	0.17 U
Benzo(k)fluoranthene	6	23		1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.39 J	0.17 UJ		0.17 U	0.17 UJ
Bis(2-ethylhexyl)phthalate	35	140		16	0.17 U	10	0.17 U	1.9	0.17 UJ	0.17 U		0.17 U	0.17 U
Butylbenzylphthalate	1200	14000		2.1	0.17 U	2.3	0.17 U	0.17 J	0.17 UJ	0.17 U		0.17 U	0.17 U
Carbazole	24	96		1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.005 J	0.17 U		0.17 U	0.17 U
Chrysene	62	230		1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.9	0.17 U		0.17 U	0.17 U
Dibenzofuran				1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U		0.17 U	0.17 U
Diethylphthalate	49000	550000		1.7 U	0.17 U	0.17 U	0.012 J	0.008 J	0.02 J	0.019 J		0.17 U	0.17 U

Table 4-1 Summary of Analytical Results for P-2 Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				R-47				Paint Locker						Acid (Oxidizer) Storage Tank							
Sample ID:				R47-CON-01		R47-CON-02		R47-CON-R7		R47-CBK-01		Paintlocker-CON-01		Paintlocker-CBK-01		Paintlocker-CAULK-01		ACID/OX-CON-01		ACID/OX-CON-02	
Analyte	RDCSRS	Non-RDCSRS	Date:	4/25/2013		4/25/2013		4/25/2013		4/25/2013		4/25/2013		4/25/2013		4/25/2013		4/25/2013		4/25/2013	
Dimethylphthalate				28		0.087	J	17		0.17	U	1.3		0.17	UJ	0.17	U	0.17	U	0.17	U
Di-n-butylphthalate	6100	68000		3.7		0.17	U	3.7		0.17	U	0.43		0.17	UJ	0.17	U	0.17	U	0.17	U
Di-n-octylphthalate	2400	27000		0.23	J	0.17	U	0.17	U	0.17	U	0.17	U	0.17	UJ	0.17	U	0.0087	J	0.17	U
Fluoranthene	2300	24000		0.29	J	0.17	U	0.17	U	0.021	J	0.003	J	2.6		0.008	J	0.17	U	0.17	U
Indeno(1,2,3-cd)pyrene	0.6	2		1.7	U	0.17	U	0.17	U	0.17	U	0.17	UJ	0.21		0.17	U	0.17	U	0.17	U
Naphthalene	6	17		1.7	U	0.012	J	0.014	J	0.17	U	0.17	U	0.011	J	0.004	J	0.17	U	0.17	U
PAHs (total)				0.82		0.152		0.014		0.045		0.011	J	8.092		0.026	J	0.17	U	0.17	UJ
Phenanthrene		300000		0.33	J	0.14	J	0.17	U	0.024	J	0.008	J	0.22		0.014	J	0.17	U	0.17	U
Pyrene	1700	18000		0.2	J	0.17	U	0.17	U	0.17	U	0.17	U	1.9		0.17	U	0.17	U	0.17	U
PCBs (mg/kg)																					
Aroclor-1248	0.2	1		680	J	4.4	J	220	J	1.8	J	0.036		0.15	J	2	J	0.033	U	0.033	U
Aroclor-1254	0.2	1		6.6	U	2.7	J	82	J	0.032	U	0.033	U	0.033	U	0.033	U	0.048		0.033	U
Aroclor-1260	0.2	1		6.6	U	0.033	U	6.6	U	0.032	U	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U
PCBs (total)	0.2	1		680		7.1		302		1.8		0.036		0.15		2		0.048		0.033	U
Pesticides (mg/kg)																					
4,4'-DDE	2	9		3.8	J	0.085	J	2.7	J	0.013	J	0.001	J	0.0033	UJ			0.0019	J	0.003	UJ
4,4'-DDT	2	8		0.066	UJ	0.18	J	0.033	U	0.003	U	0.003	UJ	0.0033	UJ			0.0033	UJ	0.003	UJ
delta-BHC				0.034	U	0.0017	UJ	0.017	UJ	0.011	J	0.001	UJ	0.0017	UJ			0.0017	UJ	0.001	UJ
Dieldrin	0.04	0.2		4.4	J	0.11	J	3.2	J	0.013	NJ	0.003	UJ	0.0033	UJ			0.0033	UJ	0.003	UJ
Endosulfan sulfate	470	6800		0.066	U	0.045	J	0.033	UJ	0.003	UJ	0.003	UJ	0.0033	UJ			0.0033	UJ	0.003	UJ
gamma-BHC (Lindane)	0.4	2		0.46	J	0.0071	J	0.79		0.007	J	0.001	UJ	0.0017	UJ			0.0017	UJ	0.001	UJ
gamma-Chlordane	0.2	1		3.7	NJ	0.098	NJ	2.7	NJ	0.014	NJ	0.001	UJ	0.0017	UJ			0.0028	J	0.001	UJ
Methoxychlor	390	5700		0.34	UJ	0.017	UJ	0.17	U	0.017	U	0.017	UJ	0.017	UJ			0.0033	J	0.017	UJ

Key:

J = Estimated value.

NJ = Analyte is “tentatively identified”, value is an approximate concentration.

R = Rejected Value.

U = Non detected.

mg/Kg = Milligrams per kilogram.

Formatting key:

Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.

Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.

Table 4-1 Summary of Analytical Results for P-2 Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				R-34							
Sample ID:				R34-CON-01		R34-CON-02		R34-CON-R6		R34-CBK-01	
Analyte	RDCSRS	Non-RDCSRS	Date:	4/25/2013		4/25/2013		4/25/2013		4/25/2013	
Perchlorate (mg/kg)											
Perchlorate	55	720		0.00037	J	0.024	J	0.01	J	0.00057	
Total Metals (mg/kg)											
Aluminum	78000			7260		8760		8230		4660	
Antimony	31	450		5.8	U	5.9	J	57.5	J	5.9	U
Arsenic	19	19		9.1		2.8		4.1		1.9	
Barium	16000	59000		71.4		58.4		51.6		55.5	
Beryllium	16	140		0.49	U	0.26	J	0.25	J	0.49	U
Cadmium	78	78		1.2		0.75		1.2		0.14	J
Calcium				98500		69200		73800		69000	
Chromium				23.7		14.4		15.7		14.6	
Cobalt	1600	590		10		9.2		10.3		6.1	
Copper	3100	45000		38.2		13.1		18.7		12.2	
Iron				72400		19000		21700		4520	
Lead	400	800		24.6		43.6		63.7		69.1	
Magnesium				13000		4730		5420		2640	
Manganese	11000	5900		519		335		284		84.6	
Nickel	1600	23000		26		14.6		15.4		8.5	
Potassium				1540		1140		1030		922	
Selenium	390	5700		8.8		3.1	J	3.7		0.65	J
Silver	390	5700		0.97	U	0.98	U	0.97	U	0.98	U
Sodium				256	J	249	J	219	J	269	J
Vanadium	78	1100		18.3		15		15.8		14.4	
Zinc	23000	110000		162		269		405		38.2	
Mercury	23	65		0.66		1.7		1		5.7	
Semivolatile Organics (mg/kg)											
1,1'-Biphenyl	3100	34000		0.0069	J	0.17	U	0.17	U	0.17	U
2-Methylnaphthalene	230	2400		0.034	J	0.17	U	0.17	U	0.4	NJ
4,6-Dinitro-2-methylphenol	6	68		0.33	U	0.33	U	0.33	U	0.33	U
4-Methylphenol	31	340		0.08	J	0.17	U	0.17	U	0.17	U
Acenaphthylene		300000		0.17	U	0.17	U	0.17	U	0.17	U
Acetophenone	2	5		0.17	U	0.17	U	0.17	U	0.17	U
Anthracene	17000	30000		0.17	U	0.17	U	0.17	U	0.17	U
Benzaldehyde	6100	68000		0.17	U	0.17	U	0.17	U	0.17	U
Benzo(a)anthracene	0.6	2		0.17	U	0.17	U	0.17	U	0.17	U
Benzo(a)pyrene	0.2	0.2		0.17	U	0.17	U	0.17	U	0.17	U
Benzo(b)fluoranthene	0.6	2		0.17	U	0.17	U	0.17	U	0.17	U
Benzo(g,h,i)perylene	380000	30000		0.17	U	0.17	U	0.17	U	0.17	U
Benzo(k)fluoranthene	6	23		0.17	U	0.17	U	0.17	U	0.17	U
Bis(2-ethylhexyl)phthalate	35	140		0.17	U	0.17	U	0.17	U	0.17	U
Butylbenzylphthalate	1200	14000		0.17	U	0.17	U	0.17	U	0.17	U
Carbazole	24	96		0.17	U	0.17	U	0.17	U	0.17	U
Chrysene	62	230		0.17	U	0.17	U	0.17	U	0.17	U
Dibenzofuran				0.01	J	0.17	U	0.17	U	0.17	U
Diethylphthalate	49000	550000		0.17	U	0.17	U	0.17	U	0.05	J

Table 4-1 Summary of Analytical Results for P-2 Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location: R-34											
Sample ID:			R34-CON-01		R34-CON-02		R34-CON-R6		R34-CBK-01		
Analyte	RDCSRS	Non-RDCSRS	Date:	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013
Dimethylphthalate				0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U		
Di-n-butylphthalate	6100	68000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.25		
Di-n-octylphthalate	2400	27000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.011 J		
Fluoranthene	2300	24000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U		
Indeno(1,2,3-cd)pyrene	0.6	2		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U		
Naphthalene	6	17		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.26		
PAHs (total)				0.05		0.17 U	0.021		0.288		
Phenanthrene		300000		0.05 J	0.17 U	0.17 U	0.17 U	0.17 U	0.028 J		
Pyrene	1700	18000		0.17 U	0.17 U	0.17 U	0.021 J	0.17 U	0.17 U		
PCBs (mg/kg)											
Aroclor-1248	0.2	1		0.032 U	0.043		0.063		0.032 U		
Aroclor-1254	0.2	1		0.032 U	0.033 U		0.093 J		0.23		
Aroclor-1260	0.2	1		0.2	0.033 U		0.033 U		0.032 U		
PCBs (total)	0.2	1		0.2	0.043		0.156		0.23		
Pesticides (mg/kg)											
4,4'-DDE	2	9		0.032 J	0.0044 J		0.0033 UJ		0.0084 J		
4,4'-DDT	2	8		0.0032 UJ	0.0033 UJ		0.0033 UJ		0.011 NJ		
delta-BHC				0.0017 UJ	0.0017 UJ		0.0017 UJ		0.0017 UJ		
Dieldrin	0.04	0.2		0.0057 NJ	0.0049 NJ		0.0037 NJ		0.007 NJ		
Endosulfan sulfate	470	6800		0.02 UJ	0.0041 J		0.0064 NJ		0.0032 UJ		
gamma-BHC (Lindane)	0.4	2		0.0017 UJ	0.0017 UJ		0.0017 UJ		0.0017 UJ		
gamma-Chlordane	0.2	1		0.009 R	0.0066 J		0.0056 J		0.0091 NJ		
Methoxychlor	390	5700		0.017 UJ	0.017 UJ		0.017 UJ		0.014 J		

Key:

J = Estimated value.

NJ = Analyte is “tentatively identified”, value is an approximate concentration.

R = Rejected Value.

U = Non detected.

mg/Kg = Milligrams per kilogram.

Formatting key:

Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.

Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.

Table 4-2 Summary of Analytical Results for South Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				Test Stand 12 (S-12)			S-46				Test Stand 11 (S-11)			
		Sample ID:		S12-CON-01	S12-CON-02	S12-CAULK-01	S46-CON-01	S46-CON-02	S46-CBK-01	S46-CAULK-01	S11-CON-01	S11-CON-R4	S11-CON-02	S11-CBK-01
Analyte	RDCSRS	Non-RDCSRS	Date:	4/25/2013	4/25/2013	4/25/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013
Perchlorate (mg/kg)														
Perchlorate	55	720		0.011	0.076		0.1	0.051	0.01		0.03	0.086 J	0.0033 J	0.0024
Total Metals (mg/kg)														
Aluminum	78000			8060	8340		8630	8140	5120		9070	7650	5950	5910
Arsenic	19	19		0.9 J	2.3		3.1	1	3.6		7.1	5.9	2.2	1
Barium	16000	59000		40.2	54.5		284	57.7	47.5		70.9	64.8	37.6	108
Beryllium	16	140		0.49 U	0.49 U		0.49 U	0.49 U	0.2 J		0.2 J	0.17 J	0.49 U	0.49 U
Cadmium	78	78		0.95	2.6		5.7	1	0.49 U		2.1	1.8	0.25 J	1.9
Calcium				69100	84200		123000	89500	64500		64900	71500	63400	63400
Chromium				13.1	14.7		32	14.6	6.9		105	87.1	8.7	10.4
Cobalt	1600	590		4.9 U	5.1		7.6	5.4	4.5 J		6.6	6.9	3.9 J	6.9
Copper	3100	45000		12.6	19.1		27.8	26.3	15.8		135	118	11.9	23.2
Iron				9060	14800		17500	10200	5410		52300	56300	11300	6650
Lead	400	800		9.7	9.9		44.2	19.7	19.1		95.1	76	5.7	4.7
Magnesium				3960	3160		17100	6650	2560		3480	3480	2680	2980
Manganese	11000	5900		161	280		307	241	122		429	440	160	90.6
Nickel	1600	23000		12.2	10.5		20.3	10.4	9.1		96.4	151	7.7	12.5
Potassium				1060	1260		2530	2540	1470		719	723	2600	978
Selenium	390	5700		1.5 J	2.5 J		3.4 U	3.4 U	0.82 J		3.4 U	3.4 U	3.4 U	3.4 U
Sodium				130 J	773		1750	2980	495		226 J	213 J	910	197 J
Vanadium	78	1100		13.1	14.6		24.2	13.8	12		25.5	24.4	11.6	21.8
Zinc	23000	110000		37.9	169		410	60.6	17.4		205	204	31.5	36.3
Mercury	23	65		0.096 U	0.032 J		2.7	0.076 J	8.1		0.2	0.12	0.0077 J	0.012 J
Semivolatile Organics (mg/kg)														
1,1'-Biphenyl	3100	34000		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.012 J	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2-Methylnaphthalene	230	2400		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.17	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
3,3'-Dichlorobenzidine	1	4		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Anthracene	17000	30000		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.17 U	0.17 U	0.005 J	0.007 J	0.17 U	0.17 U
Benzo(a)anthracene	0.6	2		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.17 U	0.17 U	0.05 J	0.065 J	0.17 U	0.17 U
Benzo(a)pyrene	0.2	0.2		0.019 J	0.17 U	0.17 U	5 U	1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Butylbenzylphthalate	1200	14000		0.17 U	0.17 U	0.17 U	5 U	2.3	0.073 J	0.17 U	0.17 U	0.006 J	0.17 U	0.17 U
Carbazole	24	96		0.17 U	0.17 U	0.17 U	5 U	0.05 J	0.17 U	0.17 U	0.006 J	0.007 J	0.17 U	0.17 U
Chrysene	62	230		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.17 U	0.17 U	0.12 J	0.15 J	0.17 U	0.17 U
Dibenzofuran				0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.005 J	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Diethylphthalate	49000	550000		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.067 J	0.012 J	0.17 U	0.17 U	0.17 U	0.17 U
Di-n-octylphthalate	2400	27000		0.17 U	0.01 J	0.17 U	0.24 J	1.7 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Fluoranthene	2300	24000		0.17 U	0.17 U	0.17 U	5 U	0.41 J	0.018 J	0.024 J	0.21	0.24	0.17 U	0.005 J
Naphthalene	6	17		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.26	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
N-Nitrosodiphenylamine	0.7	0.7		0.17 U	0.17 U	0.17 U	5 U	1.7 U	0.17 U	0.01 J	0.17 U	0.17 U	0.17 U	0.17 U
PAHs (total)				0.019	0.17 U	0.028	5 U	0.92	0.321 J	0.054	0.567 J	0.681 J	0.17 U	0.009 J
Phenanthrene		300000		0.17 U	0.17 U	0.028 J	5 U	0.2 J	0.029 J	0.03 J	0.032 J	0.039 J	0.17 U	0.004 J
Pyrene	1700	18000		0.17 U	0.17 U	0.17 U	5 U	0.31 J	0.014 J	0.17 U	0.15 J	0.18	0.17 U	0.17 U

Table 4-2 Summary of Analytical Results for South Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				Test Stand 12 (S-12)				S-46				Test Stand 11 (S-11)			
Sample ID:				S12-CON-01	S12-CON-02	S12-CAULK-01		S46-CON-01	S46-CON-02	S46-CBK-01	S46-CAULK-01	S11-CON-01	S11-CON-R4	S11-CON-02	S11-CBK-01
Analyte	RDCSRS	Non-RDCSRS	Date:	4/25/2013	4/25/2013	4/25/2013		4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013
PCBs (mg/kg)															
Aroclor-1254	0.2	1		0.032 U	1.3 J	49 J		65 J	65 J	0.64 J	0.5 J	0.033 UJ	0.033 UJ	0.033 UJ	0.032 UJ
PCBs (total)	0.2	1		0.032 U	1.3	49		65 J	65 J	0.64	0.5	0.033 UJ	0.033 UJ	0.033 UJ	0.032 UJ
Pesticides (mg/kg)															
4,4'-DDE	2	9		0.0032 UJ	0.027 NJ			1.9 J	1.7 J	0.018 J		0.003 UJ	0.003 UJ	0.003 UJ	0.003 U
4,4'-DDT	2	8		0.0032 UJ	0.0033 UJ			0.003 R	0.003 R	0.003 U		0.003 U	0.003 U	0.003 U	0.003 UJ
Dieldrin	0.04	0.2		0.0032 UJ	0.025 NJ			2.7 NJ	2 NJ	0.016 NJ		0.003 U	0.003 U	0.003 U	0.003 UJ
Endosulfan II	470	6800		0.0032 UJ	0.023 J			0.003 R	0.003 R	0.003 UJ		0.003 UJ	0.003 UJ	0.003 UJ	0.003 U
Endosulfan sulfate	470	6800		0.0032 UJ	0.0096 J			0.003 R	0.003 R	0.003 UJ		0.003 UJ	0.003 UJ	0.003 UJ	0.003 U
Endrin aldehyde				0.0032 UJ	0.017 U			0.003 R	0.003 R	0.003 UJ		0.003 UJ	0.003 UJ	0.003 UJ	0.003 U
gamma-Chlordane	0.2	1		0.0017 UJ	0.037 J			3.6	0.11 R	0.026 J		0.001 UJ	0.001 UJ	0.001 UJ	0.001 U

Key:

J = Estimated value.

R = Rejected Value.

U = Non detected.

NJ = Analyte is “tentatively identified”, value is an approximate concentration.

mg/kg = Milligrams per kilogram.

Formatting key:

Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.

Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.

Table 4-2 Summary of Analytical Results for South Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				Test Stand 37 (S-37)				S-48			T-50		
Sample ID:				S37-CON-01	S37-CON-R5	S37-CON-02	S37-CBK-01	S48-CON-01	S48-CON-02	S48-CON-R2	T50-CON-01	T50-CON-02	T50-CON-R3
Analyte	RDCSRS	Non-RDCSRS	Date:	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013
Perchlorate (mg/kg)													
Perchlorate	55	720		0.015	0.019	0.002 J	0.0015	0.00032 J	0.00027 J	0.0055	0.0081	0.0087	0.003
Total Metals (mg/kg)													
Aluminum	78000			8050	8370	6850	4810	9240	20800 J	8640 J	26600	15600	14700
Arsenic	19	19		6.5	4	1.7	6.6	0.98 U	1.2	1.8	0.97 U	1.8	0.98 U
Barium	16000	59000		53.2	54.2	41.9	78.2	44.6	31	47.7	36.2	38.3	43.8
Beryllium	16	140		0.21 J	0.2 J	0.49 U	0.49 U	0.49 U	0.5 U	0.49 U	0.49 U	0.5 U	0.49 U
Cadmium	78	78		1.1	0.66	3.5	0.78	0.4 J	0.22 J	0.42 J	0.15 J	0.17 J	0.18 J
Calcium				81700	107000	86600	41400	55100 J	58700	76400	65900	65000	62200
Chromium				135	58.6	10.7	10.1	17	14.3	19	16.3	16.1	16
Cobalt	1600	590		7.5	6.1	3.6 J	4.4 J	6.4	3.6 J	6	4.6 J	5.7	6.1
Copper	3100	45000		99.9	48.4	9	32.5	16	16.3	18.6	23.9	33.5	28
Iron				59400	38200	12300	8620	15600	11000	13000	9930	12400	13500
Lead	400	800		12.1	9.8	4.9	22.1	6.9	4.5	6.5	11.8	11.1	10.3
Magnesium				2750	2930	2880	2210	5240	4820	6770	5030	4610	5230
Manganese	11000	5900		443	334	177	248	319 J	218	255	217	222	264
Nickel	1600	23000		270	149	8.5	10.2	13.1	13.5	15.3	9.7	10.3	10.7
Potassium				678	694	3360	708	1370	937	1690	800	930	1210
Selenium	390	5700		3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.5 U	3.4 U	3.4 U	3.5 U	3.4 U
Sodium				126 J	141 J	2010	109 J	250 J	217 J	310 J	418 J	396 J	369 J
Vanadium	78	1100		23.2	23	12.7	17.3	19.7	15	20.5	16.1	17.3	18.5
Zinc	23000	110000		86.5	75.6	31.3	287	31.5	29.3	44.9	55.8	63.3	59.5
Mercury	23	65		0.019 J	0.013 J	0.0067 J	0.046 J	0.0094 J	0.089 J	0.11	0.094 U	0.0065 J	0.096 U
Semivolatile Organics (mg/kg)													
1,1'-Biphenyl	3100	34000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
2-Methylnaphthalene	230	2400		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
3,3'-Dichlorobenzidine	1	4		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.31 J	0.17 U	0.17 U
Anthracene	17000	30000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
Benzo(a)anthracene	0.6	2		0.17 U	0.009 J	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.22 J	0.011 J	0.17 U
Benzo(a)pyrene	0.2	0.2		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 UJ	0.17 UJ	0.17 UJ
Butylbenzylphthalate	1200	14000		0.17 U	0.003 J	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
Carbazole	24	96		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
Chrysene	62	230		0.17 U	0.012 J	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.24 J	0.015 J	0.17 U
Dibenzofuran				0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
Diethylphthalate	49000	550000		0.17 U	0.003 J	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
Di-n-octylphthalate	2400	27000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
Fluoranthene	2300	24000		0.17 U	0.018 J	0.17 U	0.17 U	0.002 J	0.17 U	0.17 U	0.071 J	0.005 J	0.17 U
Naphthalene	6	17		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
N-Nitrosodiphenylamine	0.7	0.7		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	0.17 U	0.17 U
PAHs (total)				0.17 UJ	0.066 J	0.17 UJ	0.17 UJ	0.002 J	0.004	0.17 UJ	0.668 J	0.031 J	0.006 J
Phenanthrene		300000		0.17 U	0.009 J	0.17 U	0.17 U	0.17 U	0.004 J	0.17 U	0.065 J	0.17 U	0.006 J
Pyrene	1700	18000		0.17 U	0.018 J	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.072 J	0.17 U	0.17 U

Table 4-2 Summary of Analytical Results for South Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location: Sample ID: AnalyteRDCSRSNon-RDCSRSDate:				Test Stand 37 (S-37)				S-48			T-50		
				S37-CON-01	S37-CON-R5	S37-CON-02	S37-CBK-01	S48-CON-01	S48-CON-02	S48-CON-R2	T50-CON-01	T50-CON-02	T50-CON-R3
				4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013	4/24/2013
PCBs (mg/kg)													
Aroclor-1254	0.2	1		0.028 J	0.021 J	0.033 U	0.033 U	0.033 U	0.033 U	0.063 J	0.15 J	0.032 UJ	0.033 UJ
PCBs (total)	0.2	1		0.028 J	0.021 J	0.033 U	0.033 U	0.033 U	0.033 U	0.063	0.15 J	0.032 UJ	0.033 UJ
Pesticides (mg/kg)													
4,4'-DDE	2	9		0.003 UJ	0.003 UJ	0.003 U	0.003 U	0.003 UJ	0.003 UJ	0.003 J	0.003 UJ	0.003 UJ	0.003 UJ
4,4'-DDT	2	8		0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.004 NJ	0.003 U	0.003 U
Dieldrin	0.04	0.2		0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
Endosulfan II	470	6800		0.003 UJ	0.003 UJ	0.003 U	0.003 U	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Endosulfan sulfate	470	6800		0.003 UJ	0.003 UJ	0.003 U	0.003 U	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Endrin aldehyde				0.003 UJ	0.003 UJ	0.003 U	0.003 U	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
gamma-Chlordane	0.2	1		0.002 NJ	0.001 J	0.001 U	0.001 J	0.001 UJ	0.001 UJ	0.003 J	0.006 J	0.001 UJ	0.001 UJ

Key:

J = Estimated value.

R = Rejected Value.

U = Non detected.

NJ = Analyte is “tentatively identified”, value is an approximate concentration.

mg/kg = Milligrams per kilogram.

Formatting key:

Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.

Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.

Table 4-2 Summary of Analytical Results for South Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Analyte		Location:		S-49			
		Sample ID:		S49-CON-01	S49-CBK-01	S49-CAULK-01	
		RDCSRS	Non-RDCSRS	Date:	4/24/2013	4/24/2013	4/24/2013
Perchlorate (mg/kg)							
Perchlorate		55	720		0.00068	0.00019 J	
Total Metals (mg/kg)							
Aluminum		78000			7140	5770	
Arsenic		19	19		0.99 U	9.1	
Barium		16000	59000		32.2	75.8	
Beryllium		16	140		0.5 U	0.45 J	
Cadmium		78	78		0.5 U	0.27 J	
Calcium					59600	43300	
Chromium					18.4	9.7	
Cobalt		1600	590		4.6 J	5	
Copper		3100	45000		14.8	30.5	
Iron					11600	12900	
Lead		400	800		4	15.3	
Magnesium					4090	2170	
Manganese		11000	5900		196	182	
Nickel		1600	23000		11.1	12.3	
Potassium					1550	1030	
Selenium		390	5700		3.5 U	3.4 U	
Sodium					672	94.1 J	
Vanadium		78	1100		16.5	13.6	
Zinc		23000	110000		26.5	63.9	
Mercury		23	65		0.006 J	0.06 J	
Semivolatile Organics (mg/kg)							
1,1'-Biphenyl		3100	34000		0.17 U	0.17 U	4.5 U
2-Methylnaphthalene		230	2400		0.17 U	0.17 U	4.5 U
3,3'-Dichlorobenzidine		1	4		0.17 U	0.17 U	4.5 U
Anthracene		17000	30000		0.17 U	0.17 U	4.5 U
Benzo(a)anthracene		0.6	2		0.17 U	0.17 U	4.5 U
Benzo(a)pyrene		0.2	0.2		0.17 U	0.17 U	4.5 U
Butylbenzylphthalate		1200	14000		0.17 U	0.17 U	4.5 U
Carbazole		24	96		0.17 U	0.17 U	4.5 U
Chrysene		62	230		0.17 U	0.17 U	4.5 U
Dibenzofuran					0.17 U	0.17 U	4.5 U
Diethylphthalate		49000	550000		0.17 U	0.17 U	4.5 U
Di-n-octylphthalate		2400	27000		0.17 U	0.17 U	4.5 U
Fluoranthene		2300	24000		0.17 U	0.17 U	4.5 U
Naphthalene		6	17		0.17 U	0.17 U	4.5 U
N-Nitrosodiphenylamine		0.7	0.7		0.17 U	0.17 U	4.5 U
PAHs (total)					0.17 UJ	0.17 UJ	4.5 UJ
Phenanthrene			300000		0.17 U	0.17 U	4.5 U
Pyrene		1700	18000		0.17 U	0.17 U	4.5 U

Table 4-2 Summary of Analytical Results for South Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				S-49					
Sample ID:				S49-CON-01		S49-CBK-01		S49-CAULK-01	
Analyte	RDCSRS	Non-RDCSRS	Date:	4/24/2013		4/24/2013		4/24/2013	
PCBs (mg/kg)									
Aroclor-1254	0.2	1		0.033	U	0.11	J	0.12	J
PCBs (total)	0.2	1		0.033	U	0.11		0.12	J
Pesticides (mg/kg)									
4,4'-DDE	2	9		0.003	U	0.003	U		
4,4'-DDT	2	8		0.003	UJ	0.003	U		
Dieldrin	0.04	0.2		0.003	UJ	0.003	U		
Endosulfan II	470	6800		0.003	U	0.003	U		
Endosulfan sulfate	470	6800		0.003	U	0.003	U		
Endrin aldehyde				0.003	U	0.003	U		
gamma-Chlordane	0.2	1		0.001	U	0.006			

Key:

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U = Non detected.

NJ = Analyte is “tentatively identified”, value is an approximate concentration.

mg/kg = Milligrams per kilogram.

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- Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.
- Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.

Table 4-3 Summary of Analytical Results for East Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Analyte		Location:		Test Stand 2 (R-2)		R-33	R-29		R-21			
		Sample ID:		R2-CON-01	R2-CON-02	R33-CON-01	R29-CON-01	R21-CON-01	R21-CON-02	R21-CON-03	R21-CBK-01	R21-CAULK-01
		RDCSRS	Non-RDCSRS	Date:	4/23/2013	4/23/2013	4/22/2013	4/22/2013	4/22/2013	4/22/2013	4/22/2013	4/22/2013
Perchlorate (mg/kg)												
Perchlorate	55	720			0.006	0.0057	0.0052	0.00051	0.00014 U	0.0056	0.0095	0.0015
Total Metals (mg/kg)												
Aluminum	78000				3980	6880	5410	8360	5060	6960	6650	4010
Arsenic	19	19			1.1	1.7	0.97 U	1.8	2.5	1.8	4.1	2.9
Barium	16000	59000			27	36.3	22	41.4	19.6 U	21.6	36.3	43.4
Beryllium	16	140			0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.5 U	0.49 U	0.49 U
Cadmium	78	78			0.49 J	0.22 J	0.47 J	0.15 J	0.22 J	0.23 J	15.5	0.49 U
Calcium					35300	47000	38100	103000	82000	75400	128000	46000
Chromium					12.3	10.5	7.1	10	6.2	6.4	9.2	6.3
Cobalt	1600	590			4.9 U	4.9 U	6.9	4.9 U	12.4	3.5 J	5.4	4.9 U
Copper	3100	45000			43.4	7.5	19.4	8.1	51.9	11.3	249	8.1
Iron					7600	8890	5430	10200	10700	8730	11500	6360
Lead	400	800			28	10.7	4.8	8	4.2	9.9	51.5	9.4
Magnesium					1600	2250	1710	4080	8280	14500	18700	1920
Manganese	11000	5900			193	199	112	308	203	228 J	376	136
Nickel	1600	23000			5.3	6	24.2	8.2	12.4	105 J	240	7.6
Potassium					317 J	1920	808	3960	634	833 J	1220	813
Selenium	390	5700			3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	1.3 J	3.4 U	3.4 U
Sodium					114 J	1240	301 J	2220	169 J	339 J	559	351 J
Vanadium	78	1100			6	10	5.5	10.9	12.3	9.5	12.7	10.1
Zinc	23000	110000			87.3	45.6	74	27.7	35.6	37.5	1540	10.4
Mercury	23	65			0.027 J	0.098 U	0.12	5.6	0.09 J	0.079 J	0.14	0.17
Semivolatile Organics (mg/kg)												
1,1'-Biphenyl	3100	34000			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
2,4-Dimethylphenol	1200	14000			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
2-Methylnaphthalene	230	2400			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.045 J
2-Methylphenol	310	3400			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
4-Methylphenol	31	340			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Acetophenone	2	5			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Benzo(a)anthracene	0.6	2			0.009 J	0.17 U	0.17 U	1.7 U	3.3 U	0.7 J	3.4 U	0.17 U
Benzo(a)pyrene	0.2	0.2			0.017 J	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Benzo(b)fluoranthene	0.6	2			0.022 J	0.17 U	0.17 U	1.7 U	3.3 U	0.41 J	3.4 U	0.17 U
Benzo(g,h,i)perylene	380000	30000			0.025 J	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Benzo(k)fluoranthene	6	23			0.017 J	0.17 U	0.17 U	1.7 U	3.3 U	0.56 J	3.4 U	0.17 U
Bis(2-ethylhexyl)phthalate	35	140			0.89	0.17 U	0.24	1.7 U	3.3 U	5.1	3.4 U	0.17 U
Butylbenzylphthalate	1200	14000			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	1.1 J	3.4 U	0.17 U
Chrysene	62	230			0.014 J	0.17 U	0.17 U	1.7 U	3.3 U	0.67 J	3.4 U	0.17 U
Dibenzo(a,h)anthracene	0.2	0.2			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Diethylphthalate	49000	550000			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.041 J
Dimethylphthalate					0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Di-n-butylphthalate	6100	68000			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Di-n-octylphthalate	2400	27000			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Fluoranthene	2300	24000			0.025 J	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Indeno(1,2,3-cd)pyrene	0.6	2			0.024 J	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Naphthalene	6	17			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.043 J
PAHs (total)					0.174	0.17 U	0.17 U	1.7 U	0.48	2.66	3.4 U	0.055
Phenanthrene		300000			0.17 U	0.17 U	0.17 U	1.7 U	0.48 J	4.2 U	3.4 U	0.012 J
Phenol	18000	3210000			0.17 U	0.17 U	0.17 U	1.7 U	3.3 U	4.2 U	3.4 U	0.17 U
Pyrene	1700	18000			0.021 J	0.17 U	0.17 U	1.7 U	3.3 U	0.32 J	3.4 U	0.17 U

Table 4-3 Summary of Analytical Results for East Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				Test Stand 2 (R-2)		R-33		R-29		R-21												
Sample ID:				R2-CON-01		R2-CON-02		R33-CON-01		R29-CON-01		R21-CON-01		R21-CON-02		R21-CON-03		R21-CBK-01		R21-CAULK-01		
Analyte	RDCSRS	Non-RDCSRS	Date:	4/23/2013		4/23/2013		4/22/2013		4/22/2013		4/22/2013		4/22/2013		4/22/2013		4/22/2013		4/22/2013		
PCBs (mg/kg)																						
Aroclor-1248	0.2	1		0.033	U	0.033	U	0.032	U	0.033	U	0.16	U	0.033	U	0.033	U	0.033	U	0.033	U	
Aroclor-1254	0.2	1		0.033	U	0.63	J	0.057	J	0.033	U	14	J	0.033	U	0.033	U	0.62	J	2.1	J	
Aroclor-1260	0.2	1		0.033	U	0.033	U	0.032	U	0.033	U	0.16	U	0.033	U	0.033	U	0.033	U	0.033	U	
PCBs (total)	0.2	1		0.033	U	0.63		0.057		0.033	U	14		0.033	U	0.033	U	0.62		2.1		
Pesticides (mg/kg)																						
4,4'-DDD	3	13		0.003	R	0.003	R	0.003	R	0.003	R	0.003	R	0.003	R	0.011	NJ	0.003	R			
4,4'-DDE	2	9		0.003	UJ	0.009	R	0.003	UJ	0.003	UJ	0.088	NJ	0.003	UJ	0.019	NJ	0.011	NJ			
4,4'-DDT	2	8		0.003	R	0.003	R	0.003	R	0.003	R	0.003	R	0.003	R	0.043	NJ	0.003	U			
Dieldrin	0.04	0.2		0.003	U	0.017	R	0.003	U	0.003	U	0.12	NJ	0.003	U	0.003	R	0.014	NJ			
Endosulfan I	470	6800		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U			
Endosulfan II	470	6800		0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ			
Endosulfan sulfate	470	6800		0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.006	J	0.003	UJ			
Endrin aldehyde				0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.008	J	0.003	UJ			
gamma-Chlordane	0.2	1		0.001	UJ	0.025	J	0.002	NJ	0.001	UJ	0.034	J	0.001	UJ	0.006	NJ	0.023	J			
Methoxychlor	390	5700		0.017	U	0.017	U	0.017	U	0.017	U	0.017	U	0.017	U	0.017	U	0.009	J			

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Table 4-3 Summary of Analytical Results for East Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				Test Stand 3 (R-3)			R-51		Test Stand 4 (R-4)					
Sample ID:				R3-CON-01	R3-CON-02	R3-CAULK-01	R51-CON-01	R51-CON-02	R4-CON-01	R4-CON-02	R4-CON-03	R4-CON-04	R4-CON-05	R4-CON-06
Analyte	RDCSRS	Non-RDCSRS	Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013
Perchlorate (mg/kg)														
Perchlorate	55	720		0.0046	0.0005		0.05	0.35	8.4	0.068	0.0056	0.0075	0.0088	0.0049
Total Metals (mg/kg)														
Aluminum	78000			7420	8180		3990 J	1950	9260	6850	10400	8790	5970	7330
Arsenic	19	19		1.4	1.8		3.1 J	0.39 J	2.2	2.5	1.5	1.6	1.7	4.9
Barium	16000	59000		50.2	32.2		80 J	22.8	29.8	41.2	42.4	39.1	38.7	58.9
Beryllium	16	140		0.49 U	0.49 U		0.53 J	0.49 U	0.5 U	0.49 U	0.16 J	0.49 U	0.49 U	0.49 U
Cadmium	78	78		0.22 J	0.49 U		1.5 J	0.49 U	2.9	0.61	0.24 J	1.5	3.4	5
Calcium				103000	86700		35700 J	23600	48300	90500	80000	48700	66300	86100
Chromium				6.9	7.2		33.5 J	4.3	37.9	15.8	11	19.9	15.1	30.8
Cobalt	1600	590		4.9 U	4.9 U		10.6	4.9 U	5 U	4.9 U	4.9 U	4.9 U	4.9 U	5.5
Copper	3100	45000		5.5	10.5		69.2 J	7	23.4	8.8	8.7	11.7	11.1	28.4
Iron				6310	7720		14500 J	3810	15800	9940	8700	8500	10600	14300
Lead	400	800		4.1	5.1		111	2.6	406	8.2	4.9	16.7	9.5	32.4
Magnesium				5560	3450		3860 J	940	2240	2970	2870	2370	2540	3320
Manganese	11000	5900		196	192		315 J	87.9	203	237	200	179	179	233
Nickel	1600	23000		4.4	6.9		35.9	2.8 J	17	7.6	8.6	10.7	11.3	14.6
Potassium				368	1740		938	766	838	1160	796	1540	664	1060
Selenium	390	5700		3.4 U	3.4 U		2.4 J	0.74 J	3.5 U	3.4 U	3.4 U	3.4 U	3.4 U	3.4 U
Sodium				1240	441 J		905	678	687	881	437 J	863	345 J	481 J
Vanadium	78	1100		8.1	9.4		11.6 J	6	9.9	11.8	11.7	9.8	10.1	13.9
Zinc	23000	110000		28.4	45.8		628	19.4	94	41.5	34.9	93.6	247	252
Mercury	23	65		0.011 J	0.14		0.026 J	0.096 U	0.1	0.025 J	1.2	4.1	0.42	0.71
Semivolatile Organics (mg/kg)														
1,1'-Biphenyl	3100	34000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
2,4-Dimethylphenol	1200	14000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	4.4	0.17 U	0.58
2-Methylnaphthalene	230	2400		0.17 U	0.17 U	5 U	0.015 J	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
2-Methylphenol	310	3400		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.061 J
4-Methylphenol	31	340		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	5.9	0.12 J	1.7
Acetophenone	2	5		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
Benzo(a)anthracene	0.6	2		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.01 J	0.17 U
Benzo(a)pyrene	0.2	0.2		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.018 J	0.014 J
Benzo(b)fluoranthene	0.6	2		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.021 J	0.17 U
Benzo(g,h,i)perylene	380000	30000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.027 J	0.017 J
Benzo(k)fluoranthene	6	23		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.021 J	0.17 U
Bis(2-ethylhexyl)phthalate	35	140		0.17 U	0.17 U	5 U	1.1	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
Butylbenzylphthalate	1200	14000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.009 J
Chrysene	62	230		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.009 J	0.17 U
Dibenzo(a,h)anthracene	0.2	0.2		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.02 J
Diethylphthalate	49000	550000		0.17 U	0.17 U	5 U	0.17 U	0.0077 J	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
Dimethylphthalate				0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
Di-n-butylphthalate	6100	68000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
Di-n-octylphthalate	2400	27000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.011 J	0.17 U
Fluoranthene	2300	24000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
Indeno(1,2,3-cd)pyrene	0.6	2		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.008 J	0.17 U	1.7 U	3.4 U	0.032 J	0.016 J
Naphthalene	6	17		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
PAHs (total)				0.17 U	0.17 U	5 U	0.16	0.17 U	0.008	0.17 U	1.7 U	3.4 U	0.138	0.067
Phenanthrene		300000		0.17 U	0.17 U	5 U	0.16 J	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U
Phenol	18000	3210000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	2.9
Pyrene	1700	18000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	0.17 U	0.17 U	1.7 U	3.4 U	0.17 U	0.17 U

Table 4-3 Summary of Analytical Results for East Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				Test Stand 3 (R-3)						R-51		Test Stand 4 (R-4)															
Sample ID:				R3-CON-01		R3-CON-02		R3-CAULK-01		R51-CON-01		R51-CON-02		R4-CON-01		R4-CON-02		R4-CON-03		R4-CON-04		R4-CON-05		R4-CON-06			
Analyte	RDCSRS	Non-RDCSRS	Date:	4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013			
PCBs (mg/kg)																											
Aroclor-1248	0.2	1		0.033	U	0.033	U	0.032	U	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U	0.032	U	0.033	U		
Aroclor-1254	0.2	1		0.033	U	0.033	U	0.032	U	0.093		0.026	J	0.035	J	0.033	U	0.027	J	0.5	J	0.063	J	0.033	U		
Aroclor-1260	0.2	1		0.033	U	0.033	U	0.032	U	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U	0.033	U	0.032	U	1.1	J		
PCBs (total)	0.2	1		0.033	U	0.033	U	0.032	U	0.093		0.026		0.035		0.033	U	0.027		0.5		0.063		1.1			
Pesticides (mg/kg)																											
4,4'-DDD	3	13		0.003	R	0.003	R			0.0033	R	0.0033	R	0.003	R	0.003	R	0.003	R	0.003	R	0.003	R	0.003	R		
4,4'-DDE	2	9		0.003	UJ	0.003	UJ			0.0033	UJ	0.0033	UJ	0.004	J	0.003	UJ	0.003	UJ	0.015	NJ	0.003	UJ	0.003	R		
4,4'-DDT	2	8		0.003	U	0.003	U			0.0033	UJ	0.0033	UJ	0.005	R	0.003	U	0.003	U	0.026	NJ	0.003	U	0.003	U		
Dieldrin	0.04	0.2		0.003	U	0.003	U			0.026	NJ	0.0033	UJ	0.003	U	0.003	U	0.003	U	0.009	R	0.003	U	0.02			
Endosulfan I	470	6800		0.001	U	0.001	U			0.024	J	0.0017	UJ	0.001	U	0.001	U	0.001	U	0.012	J	0.001	U	0.001	U		
Endosulfan II	470	6800		0.003	UJ	0.003	UJ			0.017	NJ	0.0033	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ		
Endosulfan sulfate	470	6800		0.003	UJ	0.003	UJ			0.023	J	0.0033	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ		
Endrin aldehyde				0.003	UJ	0.003	UJ			0.023	J	0.0033	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.003	UJ	0.029	R		
gamma-Chlordane	0.2	1		0.001	UJ	0.001	UJ			0.015	J	0.0012	J	0.002	NJ	0.001	UJ	0.001	J	0.017	J	0.002	J	0.019	J		
Methoxychlor	390	5700		0.017	U	0.017	U			0.017	UJ	0.017	UJ	0.017	U	0.017	U	0.017	U	0.017	U	0.017	U	0.017	U		

Key:

J = Estimated value.

R = Rejected Value.

U = Non detected.

NJ = Analyte is “tentatively identified”, value is an approximate concentration.

mg/kg = Milligrams per kilogram.

Formatting key:

Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.

Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.

Table 4-3 Summary of Analytical Results for East Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location:				Test Stand 4 (R-4)		Scrubber		Water Cooling Tower		Condenser and Hotwell				Agitator and Effluent Treatment Basin		
Sample ID:		R4-CON-07	R4-CBK-01	SCRUBBER-CON-01	SCRUBBER-CON-02	WCT-CON-01	COND/HW-CON-01	COND/HW-CON-02	AGITATOR-CON-01	AGITATOR-CBK-01						
Analyte	RDCSRS	Non-RDCSRS	Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013			
Perchlorate (mg/kg)																
Perchlorate	55	720		0.022	0.0011	0.089	0.0031	0.00029	J	0.00039	J	0.0002	U	0.0081	0.001	
Total Metals (mg/kg)																
Aluminum	78000			8670	3620	12700	9990	8790		19000		5410		26500	4920	
Arsenic	19	19		5.4	3.6	1.2	2.9	1.4		1.5		2.4		1.7	1.7	
Barium	16000	59000		62.8	25.9	39.4	62.4	33.8		31.6		27.7		31.7	27.7	
Beryllium	16	140		0.5	U	0.49	U	0.16	J	0.24	J	0.16	J	0.49	U	
Cadmium	78	78		3.2	0.49	U	0.23	J	0.34	J	0.57	0.31	J	0.19	J	
Calcium				144000	33200	55800	87900	75900		45800		94900		31000	44000	
Chromium				31.6	5.5	13.5	23.9	8.8		9.5		11.8		10.3	5.6	
Cobalt	1600	590		5.1	4.9	U	2.8	J	4.7	J	5	U	4.9	U	4.9	U
Copper	3100	45000		19	6.3		11.1		20.1		8.1	8.6		10	10.7	
Iron				17600	6960	10400	13600	8210		9410		9140		10500	6790	
Lead	400	800		19	7.1	21.3	53.2	10.6		10.8		6		5.6	4.8	
Magnesium				4910	2260	3940	4510	3260		2530		2670		3790	2290	
Manganese	11000	5900		285	190	177	250	228		241		140		375	139	
Nickel	1600	23000		15.6	4.9	7.1	11.7	5.7		6.5		5.7		10.4	8.2	
Potassium				888	589	548	1030	389	J	557		259	J	365	J	
Selenium	390	5700		3.5	U	3.4	U	3.5	U	3.4	U	1.5	J	1.5	J	
Sodium				520	182	J	394	J	400	J	68.6	J	186	J	76.7	J
Vanadium	78	1100		16.1	6.8	11.7	15.1	11.6		11.4		25		13.1	8.4	
Zinc	23000	110000		230	28.4	117	194	216		170		22.4		69.7	21.3	
Mercury	23	65		0.12	0.14	0.015	J	0.053	J	0.098	U	0.1	U	0.096	U	
Semivolatile Organics (mg/kg)																
1,1'-Biphenyl	3100	34000		0.17	U	0.17	U	0.17	U	0.016	J	0.17	U	0.17	U	
2,4-Dimethylphenol	1200	14000		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
2-Methylnaphthalene	230	2400		0.17	U	0.17	U	0.17	U	0.02	J	0.17	U	0.17	U	
2-Methylphenol	310	3400		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
4-Methylphenol	31	340		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Acetophenone	2	5		0.17	U	0.18		0.17	U	1.2		0.17	U	0.17	U	
Benzo(a)anthracene	0.6	2		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Benzo(a)pyrene	0.2	0.2		0.016	J	0.17	U	0.17	U	0.17	U	0.17	U	0.025	J	
Benzo(b)fluoranthene	0.6	2		0.016	J	0.009	J	0.17	U	0.17	U	0.17	U	0.17	UJ	
Benzo(g,h,i)perylene	380000	30000		0.021	J	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Benzo(k)fluoranthene	6	23		0.009	J	0.01	J	0.17	U	0.17	U	0.17	U	0.17	UJ	
Bis(2-ethylhexyl)phthalate	35	140		0.17	U	0.29		0.17	U	0.17	U	0.17	U	0.17	U	
Butylbenzylphthalate	1200	14000		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Chrysene	62	230		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Dibenzo(a,h)anthracene	0.2	0.2		0.017	J	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Diethylphthalate	49000	550000		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Dimethylphthalate				0.17	U	0.17	U	0.17	U	0.064	J	0.17	U	0.17	U	
Di-n-butylphthalate	6100	68000		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Di-n-octylphthalate	2400	27000		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.021	J	
Fluoranthene	2300	24000		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Indeno(1,2,3-cd)pyrene	0.6	2		0.019	J	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Naphthalene	6	17		0.17	U	0.17	U	0.17	U	0.011	J	0.17	U	0.17	U	
PAHs (total)				0.098		0.019		0.17	U	0.028		0.17	U	0.025	J	
Phenanthrene		300000		0.17	U	0.17	U	0.17	U	0.017	J	0.17	U	0.17	U	
Phenol	18000	3210000		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	
Pyrene	1700	18000		0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	

Table 4-3 Summary of Analytical Results for East Stand Area, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey

Location: Sample ID:				Test Stand 4 (R-4)				Scrubber		Water Cooling Tower		Condenser and Hotwell				Agitator and Effluent Treatment Basin					
				R4-CON-07		R4-CBK-01		SCRUBBER-CON-01		SCRUBBER-CON-02		WCT-CON-01		COND/HW-CON-01		COND/HW-CON-02		AGITATOR-CON-01		AGITATOR-CBK-01	
Analyte	RDCSRS	Non-RDCSRS	Date:	4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013		4/23/2013	
PCBs (mg/kg)																					
Aroclor-1248	0.2	1		0.033	U	0.032	U	0.033	U	0.032	U	0.032	U	0.032	U	0.21	J	0.033	U	0.059	J
Aroclor-1254	0.2	1		0.033	U	0.032	U	0.033	U	0.032	U	0.032	U	0.032	U	0.033	U	0.033	U	0.033	U
Aroclor-1260	0.2	1		0.033	U	0.032	U	0.033	U	0.17		0.032	U	0.032	U	0.033	U	0.033	U	0.033	U
PCBs (total)	0.2	1		0.033	U	0.032	U	0.033	U	0.17		0.032	U	0.032	U	0.21		0.033	U	0.059	
Pesticides (mg/kg)																					
4,4'-DDD	3	13		0.003	R	0.003	R	0.0033	R	0.0032	R	0.0032	R	0.0032	R	0.0033	R	0.0033	R	0.0033	R
4,4'-DDE	2	9		0.003	UJ	0.003	UJ	0.0033	U	0.0032	U	0.0032	U	0.0032	U	0.0033	UJ	0.0033	UJ	0.0033	UJ
4,4'-DDT	2	8		0.003	U	0.003	U	0.0033	U	0.0032	U	0.0032	U	0.0032	U	0.0033	UJ	0.0033	UJ	0.0033	UJ
Dieldrin	0.04	0.2		0.003	U	0.003	U	0.0033	U	0.0022	J	0.0032	U	0.0032	U	0.0033	UJ	0.0033	UJ	0.0033	UJ
Endosulfan I	470	6800		0.001	U	0.001	U	0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0017	UJ	0.0017	UJ	0.0017	UJ
Endosulfan II	470	6800		0.003	UJ	0.003	UJ	0.0033	U	0.0032	U	0.0032	U	0.0032	U	0.0033	UJ	0.0033	UJ	0.0033	UJ
Endosulfan sulfate	470	6800		0.003	UJ	0.003	UJ	0.0033	U	0.013	NJ	0.0032	U	0.0032	U	0.0033	UJ	0.0033	UJ	0.0033	UJ
Endrin aldehyde				0.003	UJ	0.003	UJ	0.0033	U	0.0043	R	0.0032	U	0.0032	U	0.0033	UJ	0.0033	UJ	0.0033	UJ
gamma-Chlordane	0.2	1		0.001	UJ	0.001	UJ	0.0017	U	0.0038		0.0017	U	0.0017	U	0.0029	NJ	0.0017	UJ	0.0017	UJ
Methoxychlor	390	5700		0.017	U	0.017	U	0.017	U	0.017	U	0.017	U	0.017	U	0.017	UJ	0.017	UJ	0.017	UJ

Key:

J = Estimated value.

R = Rejected Value.

U = Non detected.

NJ = Analyte is “tentatively identified”, value is an approximate concentration.

mg/kg = Milligrams per kilogram.

Formatting key:

Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.

Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.

Table 4-4 Summary of Detected Analytical Results for Tank Samples, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

				Location:	R-34	Water Tower	Water Tower
				Sample ID:	R34-OIL-01	WATERTOWER-AST-01 UPPER PHASE	WATERTOWER-AST-01 LOWER PHASE
Analyte	RDCSRSCon	Non-RDCSRSE	Date:	4/26/2013	4/26/2013	4/26/2013	
Lead (mg/kg)							
Lead	400	800		2.5	18	0.77	U
PCBs (mg/kg)							
Aroclor-1254	0.2	1		35 D			
Aroclor-1260	0.2	1		20 J			
PCBs (total)	0.2	1		55 J			
GRO/DRO (mg/kg)							
Motor Oils				560000 J			
Petroleum Hydrocarbons C10-C28				1100000 J			
Petroleum Hydrocarbons C6-C10				12 UJ	28000 J	350	M

Key:

J = Estimated value.

R - Rejected Value.

D = Diluted.

M = Manual integration.

U = Non detected.

mg/Kg = Milligrams per kilogram.

Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.

Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.

Table 4-5 Summary of Detected Analytical Results for Water Samples, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	SWQC-FW2 Acute	SWQC-FW2 Chronic	Date:	Location:	No. 1 Sewage Treatment Plant	Cistern/Cistern Pump	Cistern/Cistern Pump		
				Sample ID:	NO1STP- WATER-01	CISTERN- WATER-01	CISTERN- WATER-R8		
					4/26/2013	4/26/2013	4/26/2013		
Perchlorate (mg/L)									
Perchlorate				0.00005	U	0.077	J	0.022	J
Total Metals (mg/L)									
Aluminum				0.02	U	3.31	J	0.205	J
Arsenic	0.34	0.15		0.001	U	0.0013		0.0014	
Barium				0.01	U	0.0442		0.01	U
Beryllium				0.001	U	0.00018	J	0.001	U
Cadmium				0.001	U	0.129		0.122	
Calcium				8.84		69.5	J	48.3	
Chromium	0.015	0.01		0.002	U	0.314	J	0.0453	J
Cobalt				0.001	U	0.0056	J	0.001	U
Copper				0.002	U	0.0032		0.002	U
Iron				0.224		30.3	J	1.09	J
Lead	0.038	0.0054		0.001	U	0.0147		0.0062	
Magnesium				1.3		2.77		1.58	
Manganese				0.262		0.32	J	0.0639	J
Nickel				0.0013		0.0221	J	0.0039	J
Potassium				6.27		12.9	J	12	
Sodium				1.06		25.7		25.6	
Vanadium				0.005	U	0.0449	J	0.005	U
Zinc				0.0137		0.105	J	0.0217	J
Semivolatile Organics (mg/L)									
Butylbenzylphthalate				0.00016	J	0.005	U	0.005	U
Trichloroethene				0.005	U	0.005	U	0.005	U

Table 4-5 Summary of Detected Analytical Results for Water Samples, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	SWQC-FW2 Acute	SWQC-FW2 Chronic	Date:	Location:	No. 1 Sewage Treatment Plant	Cistern/Cistern Pump	Cistern/Cistern Pump
				Sample ID:	NO1STP- WATER-01	CISTERN- WATER-01	CISTERN- WATER-R8
					4/26/2013	4/26/2013	4/26/2013
PCBs (mg/L)							
Aroclor-1248				0.001	U	0.0036	0.0057 J+
PCBs (total)		0.000014		0.001	U	0.0036	0.0057
Pesticides (mg/L)							
4,4'-DDE				0.0001	UJ	0.0001 UJ	0.000061 J
gamma-BHC (Lindane)	0.00095			0.00005	U	0.00005 U	0.000034 J
gamma-Chlordane	0.0024	0.0000043		0.00005	UJ	0.00005 UJ	0.000083 NJ
Volatiles (mg/L)							
1,1-Dichloroethane				0.005	U	0.00019 J	0.005 U
Carbon Disulfide				0.00019	J	0.005 U	0.005 U
trans-1,3-Dichloropropene				0.005	UJ	0.005 U	0.00018 J

Key:

J = Estimated value.

R - Rejected Value.

U = Non detected.

NJ = Analyte is "tentatively identified", value is an approximate concentration.

mg/L = Milligrams per liter.

Formatting key:

Blue Highlight = Indicates value exceeds both the SWQC-FW2 Acute and Chronic Standards.

Yellow Highlight = Indicates value exceeds either the SWQC-FW2 Acute or the Chronic Standards.

Table 4-6 Summary of Analytical Results for Soil Samples (East Stand Area), Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Location:				R-33		R-21			
Sample ID:				R33-SOIL-01		R21-SOIL-01		R21-SOIL-R1	
Analyte	RDCSRS	Non-RDCSRS	Date:	4/22/2013		4/22/2013		4/22/2013	
Perchlorate (mg/kg)									
Perchlorate	55	720		0.00026	U	0.00037	J	0.00037	J
Total Metals (mg/kg)									
Aluminum	78000			6400		5860		5770	
Arsenic	19	19		3.3		2.1		1.9	
Beryllium	16	140		0.57	U	0.2	J	0.22	J
Cadmium	78	78		2		0.18	J	0.16	J
Calcium				662		4520		6050	
Chromium				18.5		9.4		9.5	
Cobalt	1600	590		6.2		6		5.3	J
Copper	3100	45000		50		17.5		14.9	
Iron				27800		15500		13800	
Lead	400	800		308		5.4		5	
Magnesium				1340		3320		2870	
Manganese	11000	5900		164		302		292	
Nickel	1600	23000		17.6		11.7		11.1	
Potassium				628		641		683	
Sodium				73.6	J	196	J	207	J
Vanadium	78	1100		36.4		18.6		17.2	
Zinc	23000	110000		486		30.2		29.1	
Mercury	23	65		0.68		0.11	U	0.11	U
Semivolatile Organics (mg/kg)									
2-Methylnaphthalene	230	2400		0.18	U	0.0074	J	0.18	U
Acenaphthene	3400	37000		0.18	U	0.071	J	0.038	J
Anthracene	17000	30000		0.18	U	0.067	J	0.053	J
Benzo(a)anthracene	0.6	2		0.18	U	0.18	U	0.42	
Benzo(a)pyrene	0.2	0.2		0.18	UJ	0.18	UJ	0.35	J
Benzo(b)fluoranthene	0.6	2		0.18	UJ	0.18	UJ	0.31	J
Benzo(g,h,i)perylene	380000	30000		0.18	U	0.18	U	0.28	
Benzo(k)fluoranthene	6	23		0.18	UJ	0.18	UJ	0.26	J
Bis(2-ethylhexyl)phthalate	35	140		6.4		0.18	U	0.18	U
Carbazole	24	96		0.18	U	0.046	J	0.03	J
Chrysene	62	230		0.18	U	0.19		0.41	
Dibenzofuran				0.18	U	0.02	J	0.011	J

Table 4-6 Summary of Analytical Results for Soil Samples (East Stand Area), Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

			Location:	R-33	R-21			
			Sample ID:	R33-SOIL-01	R21-SOIL-01		R21-SOIL-R1	
Analyte	RDCSRS	Non-RDCSRS	Date:	4/22/2013	4/22/2013	4/22/2013	4/22/2013	4/22/2013
Diethylphthalate	49000	550000		0.066 J	0.18 U	0.18	U	U
Di-n-butylphthalate	6100	68000		0.19	0.18 U	0.18	U	U
Fluoranthene	2300	24000		0.013 J	0.4	0.74		
Fluorene	2300	24000		0.18 U	0.039 J	0.023	J	
Indeno(1,2,3-cd)pyrene	0.6	2		0.18 U	0.18 U	0.3		
Naphthalene	6	17		0.18 U	0.015 J	0.0064	J	
PAHs (total)				0.013 J	1.43 J	4.02		
Phenanthrene		300000		0.18 U	0.31	0.2		
Phenol	18000	3210000		0.18 U	0.18 U	0.047	J	
Pyrene	1700	18000		0.18 U	0.34	0.63		
Volatiles (mg/kg)								
1,2-Dichloroethane	0.008	0.04		0.004 U	0.0047	0.0056	J	
Acetone	70000			0.008 U	0.012	0.017		
Chloroform	0.6	1		0.004 U	0.0043	0.004	U	
Ethylbenzene				0.0034 J	0.0029 J	0.004		
Isopropylbenzene				0.00062 J	0.00059 J	0.00078	J	
m,p-Xylene	12000	170000		0.0059	0.0055	0.0074		
o-Xylene	12000	170000		0.017	0.015	0.02		

Key:

J = Estimated value.

R = Rejected Value.

U = Non detected.

mg/kg = Milligrams per kilogram.

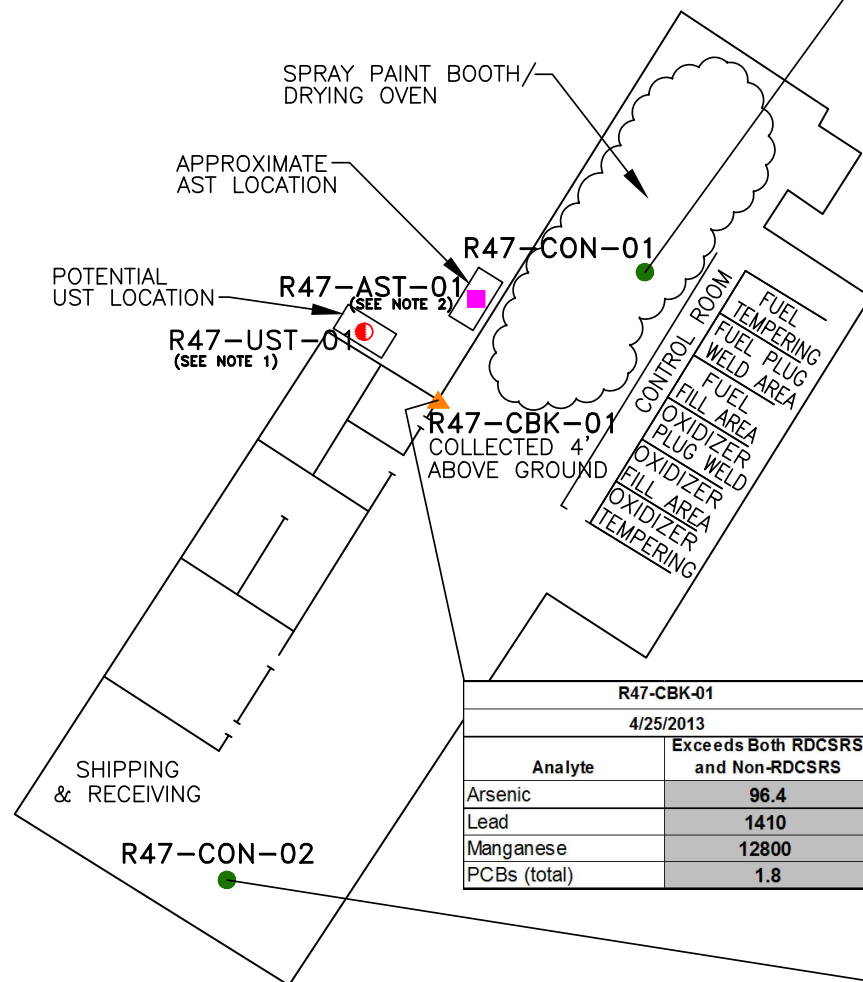
Formatting key:

Blue Highlight = Indicates value exceeds both the NJDEP RDCSRS and NJDEP Non-RDCSRS screening standards.

Yellow Highlight = Indicates value exceeds the NJDEP RDCSRS Screening Standard.



R-47 (P2 AREA)



R47-CBK-01	
4/25/2013	
Analyte	Exceeds Both RDCSRS and Non-RDCSRS
Arsenic	96.4
Lead	1410
Manganese	12800
PCBs (total)	1.8

R47-CON-01		
4/25/2013		
Analyte	Exceeds Both RDCSRS and Non-RDCSRS	Exceeds RDCSRS Only
PCBs (total)	680	-
4,4'-DDE	-	3.8 J
Dieldrin	4.4 J	-
gamma-BHC (Lindane)	-	0.46 J
gamma-Chlordane	3.7 NJ	-

R47-CON-R7		
4/25/2013		
Analyte	Exceeds Both RDCSRS and Non-RDCSRS	Exceeds RDCSRS Only
PCBs (total)	302	-
4,4'-DDE	-	2.7 J
Dieldrin	3.2 J	-
gamma-BHC (Lindane)	-	0.79
gamma-Chlordane	2.7 JN	-

LEGEND

- R47-CON-01 ● CONCRETE SAMPLE
- R47-AST-01 ■ ABOVE GROUND STORAGE TANK SAMPLE
- R47-UST-01 ● UNDERGROUND STORAGE TANK SAMPLE
- R47-CBK-01 ▲ CINDERBLOCK SAMPLE
- NJ ANALYTE IS "TENTATIVELY IDENTIFIED", VALUE IS AN APPROXIMATE CONCENTRATION.
- J ESTIMATED VALUE

NOTES

1. NO UST EXISTS AT LOCATION R47-UST-01, THEREFORE NO SAMPLE WAS COLLECTED.
2. LOCATION R47-AST-01 WAS DRY, THEREFORE NO SAMPLE WAS COLLECTED.
3. DUPLICATE SAMPLE R47-CON-R7 WAS COLLECTED AT R47-CON-01 LOCATION.
4. SAMPLE CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).

R47-CON-02		
4/25/2013		
Analyte	Exceeds Both RDCSRS and Non-RDCSRS	Exceeds RDCSRS Only
PCBs (total)	7.1	-
Dieldrin	-	0.11 J

FIGURE 4-1 SAMPLE LOCATIONS WITH EXCEEDANCES, R-47 RADIATION TECHNOLOGY SUPERFUND SITE, OU3 ROCKAWAY TOWNSHIP, NEW JERSEY

R2-0001894



PAINT LOCKER (P2 AREA)

PAINT LOCKER-CAULK-01
DOORWAY

Paint locker-CAULK-01	
4/25/2013	
Analyte	Exceeds Both RDCSRS and Non-RDCSRS
PCBs (total)	2

Paint locker-CBK-01		
4/25/2013		
Analyte	Exceeds Both RDCSRS and Non-RDCSRS	Exceeds RDCSRS Only
Benzo(a)anthracene	-	0.79
Benzo(a)pyrene	0.3 J	-

PAINT LOCKER-CBK-01
COLLECTED 3.5'
ABOVE GROUND

PAINT LOCKER-CON-01

DOORWAY

LEGEND

PAINT LOCKER-CON-01 ●	CONCRETE SAMPLE
PAINT LOCKER-CBK-01 ▲	CINDERBLOCK SAMPLE
PAINT LOCKER-CAULK-01 ■	CAULK SAMPLE
J	ESTIMATED VALUE

NOTE

1. PAINT LOCKER-CAULK-01 WAS COLLECTED FROM EXTERIOR DOOR FRAME. COULD NOT ACCESS INTERIOR DOOR FRAME DUE TO DEBRIS.
2. SAMPLE CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).

SCALE IN FEET



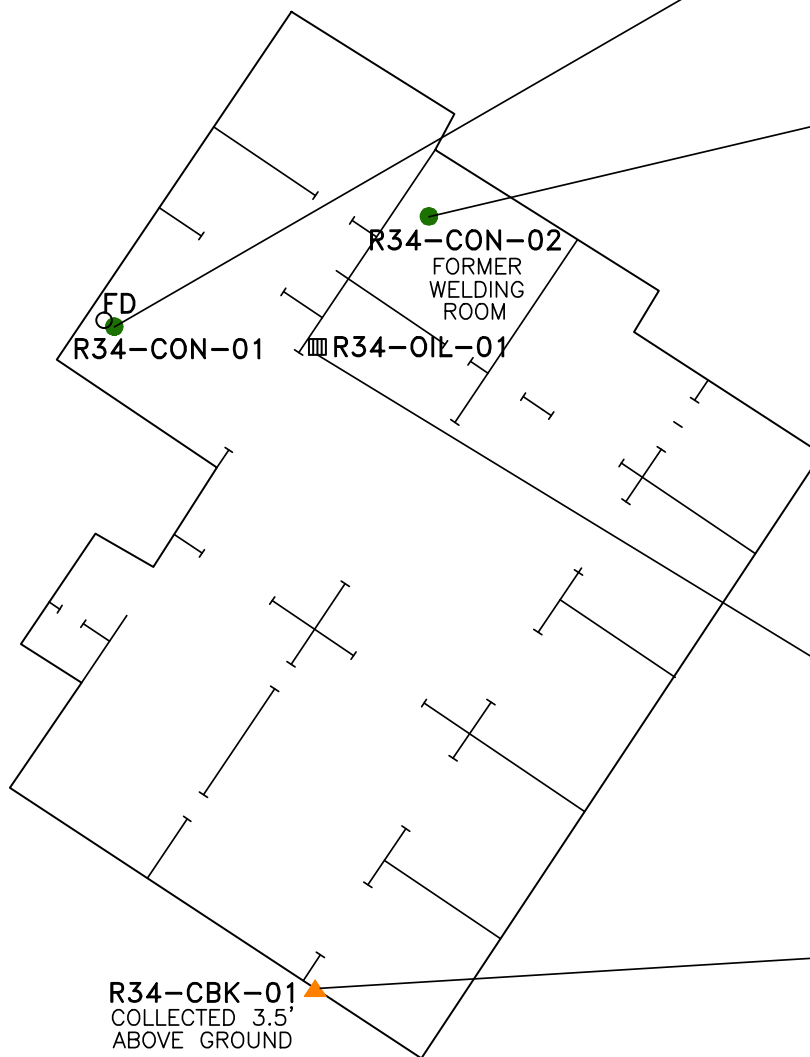
ecology and environment

FIGURE 4-2 SAMPLE LOCATIONS WITH EXCEEDANCES, PAINT LOCKER RADIATION TECHNOLOGY SUPERFUND SITE, OU3 ROCKAWAY TOWNSHIP, NEW JERSEY

R2-0001895



R-34 (P2 AREA)



R34-CON-01	
4/25/2013	
Analyte	Exceeds RDCSRS Only
PCBs (total)	0.2

R34-CON-R6	
4/25/2013	
Analyte	Exceeds RDCSRS Only
Antimony	57.5 J

LEGEND

R34-CON-01 ●	CONCRETE SAMPLE
R34-CBK-01 ▲	CINDERBLOCK SAMPLE
R34-OIL-01 ▨	TRANSFORMER OIL
FD ○	FLOOR DRAIN
J	ESTIMATED VALUE

NOTE

1. DUPLICATE SAMPLE (R34-CON-R6) TAKEN AT R34-CON-02.
2. SAMPLE CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).

R34-OIL-01	
4/26/2013	
Analyte	Exceeds Both RDCSRS and Non-RDCSRS
PCBs (total)	55 J

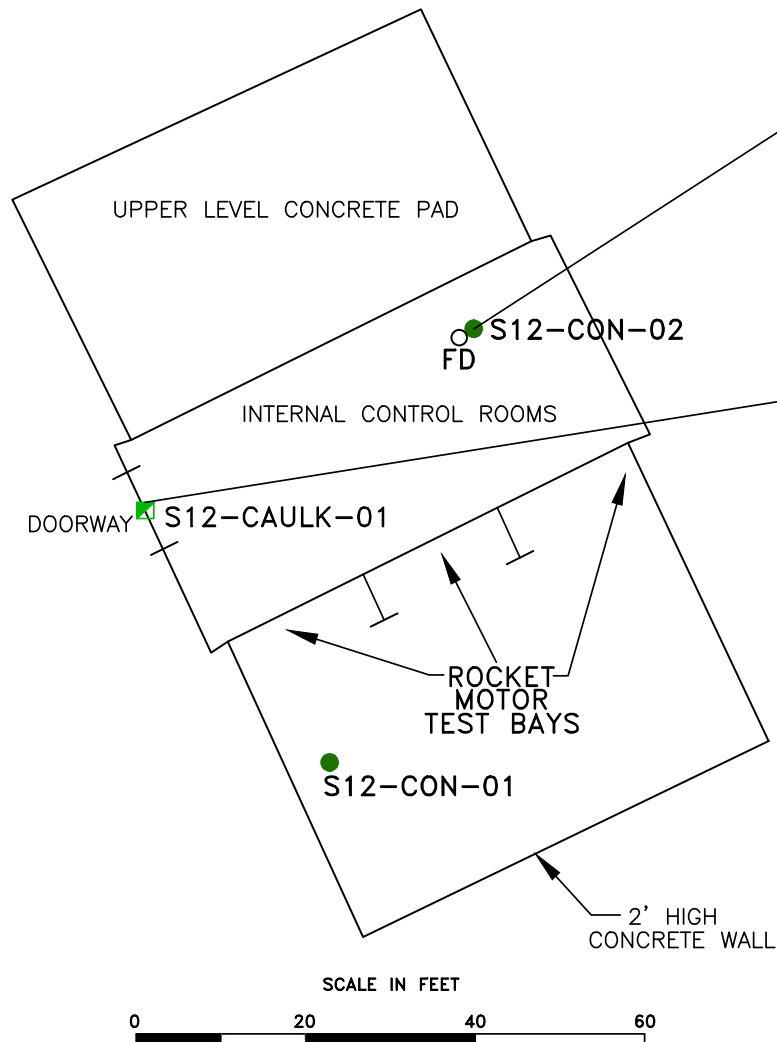
R34-CBK-01	
4/25/2013	
Analyte	Exceeds RDCSRS Only
PCBs (total)	0.23

SCALE IN FEET





TEST STAND 12 S-12 (SOUTH STAND AREA)



S12-CON-02	
4/25/2013	
Analyte	Exceeds Both RDCSRS and Non-RDCSRS
PCBs (total)	1.3

S12-CAULK-01	
4/25/2013	
Analyte	Exceeds Both RDCSRS and Non-RDCSRS
PCBs (total)	49

LEGEND

S12-CON-01 ●	CONCRETE SAMPLE
S12-CAULK-01 ■	CAULK SAMPLE
FD ○	FLOOR DRAIN

NOTES

1. S12-CAULK-01 COLLECTED FROM DOOR FRAME.
2. DUPLICATE SAMPLE (R34-CON-R6) COLLECTED AT R34-CON-02 LOCATION.
3. SAMPLE CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).



S-46 (SOUTH STAND AREA)

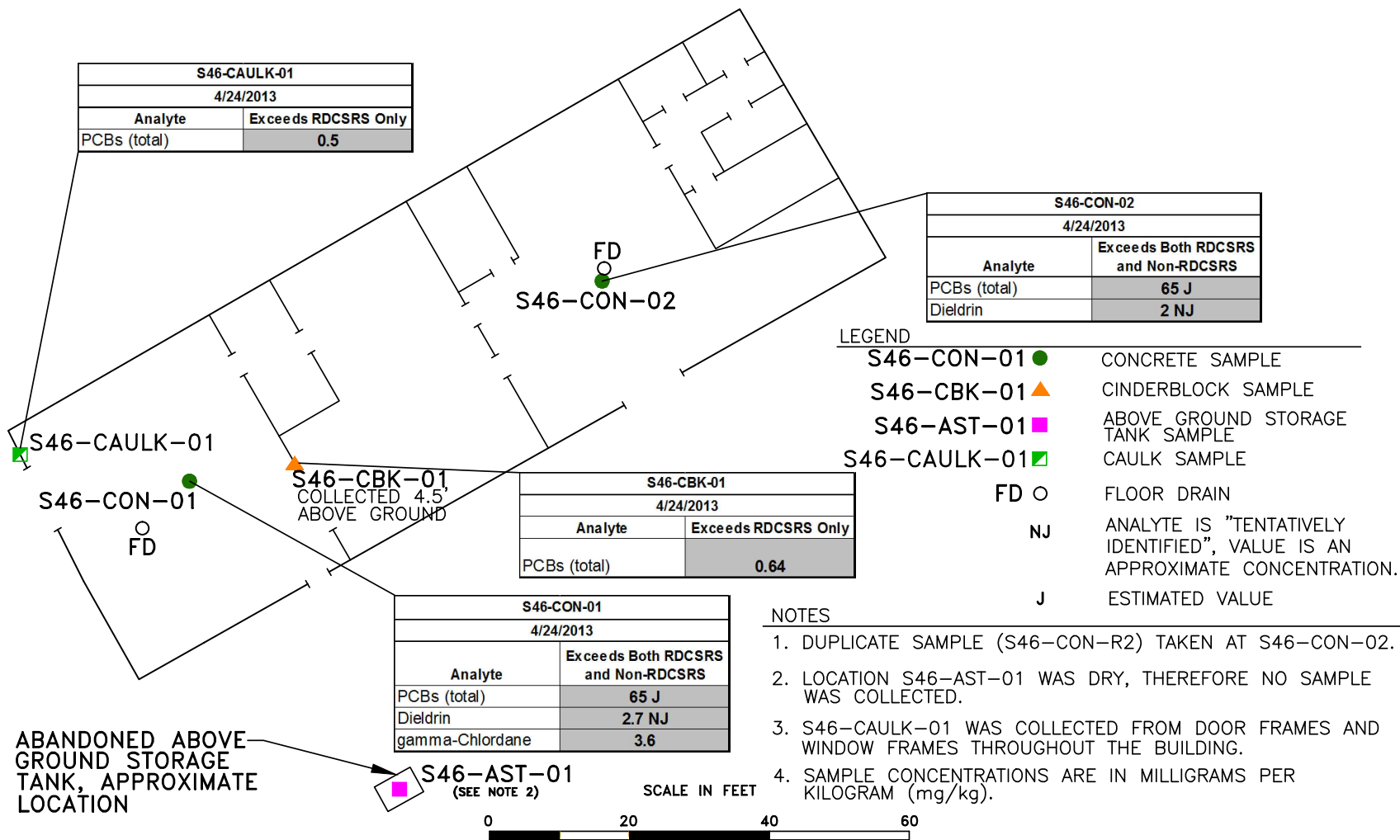


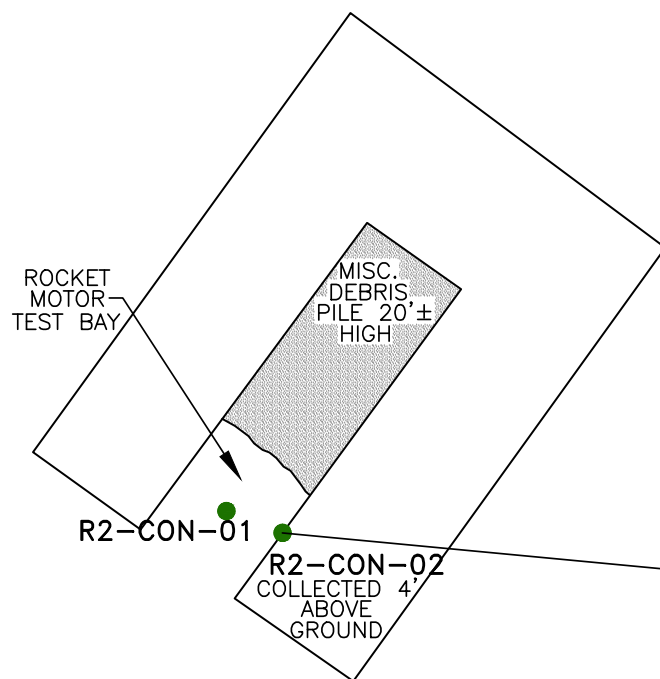
FIGURE 4-5

SAMPLE LOCATIONS WITH EXCEEDANCES, S-46
RADIATION TECHNOLOGY SUPERFUND SITE, OJ3
ROCKAWAY TOWNSHIP, NEW JERSEY

R2-0001898



TEST STAND 2 R-2 (EAST STAND AREA)



LEGEND

R2-CON-01 ● CONCRETE SAMPLE

NOTE

1. SAMPLE CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).

R2-CON-02	
4/23/2013	
Analyte	Exceeds RDCSRS Only
PCBs (total)	0.63



R-21 (EAST STAND AREA)

NOTES

1. DUPLICATE SAMPLE (S21-SOIL-R1) COLLECTED AT AT S21-SOIL-01 LOCATION.
2. SAMPLE CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).

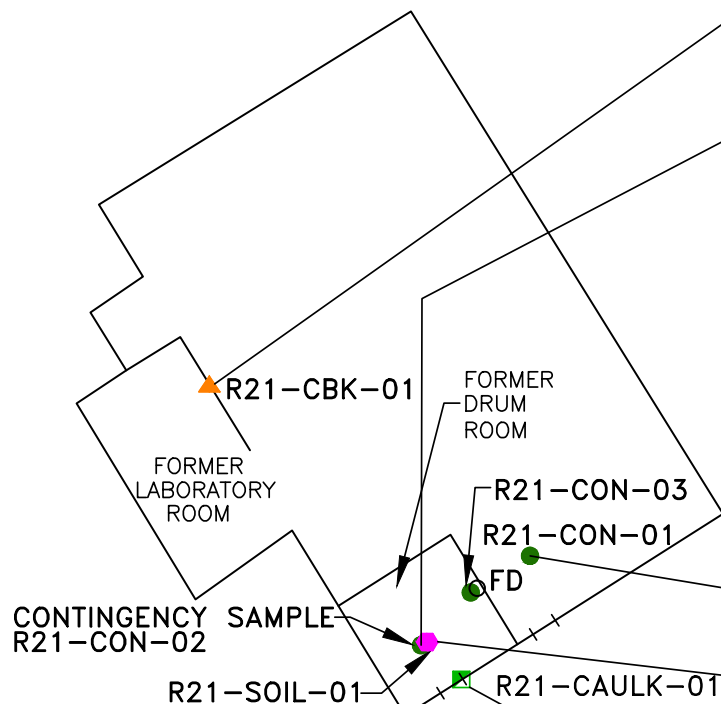
R21-CBK-01	
4/22/2013	
Analyte	Exceeds RDCSRS Only
PCBs (total)	0.62

R21-CON-02	
4/22/2013	
Analyte	Exceeds RDCSRS Only
Benzo(a)anthracene	0.7 J

LEGEND

R21-CON-01	●	CONCRETE SAMPLE
R21-CBK-01	▲	CINDERBLOCK SAMPLE
R21-CAULK-01	■	CAULK SAMPLE
R21-SOIL-01	●	SOIL SAMPLE
FD	○	FLOOR DRAIN
NJ		ANALYTE IS "TENTATIVELY IDENTIFIED", VALUE IS AN APPROXIMATE CONCENTRATION.
J		ESTIMATED VALUE

R21-CON-01		
4/22/2013		
Analyte	Exceeds Both RDCSRS and Non-RDCSRS	Exceeds RDCSRS Only
PCBs (total)	14	-
Dieldrin	-	0.12 NJ



R21-CAULK-01	
4/22/2013	
Analyte	Exceeds Both RDCSRS and Non-RDCSRS
PCBs (total)	2.1

R21-SOIL-R1	
4/22/2013	
Analyte	Exceeds Both RDCSRS and Non-RDCSRS
Benzo(a)pyrene	0.35 J

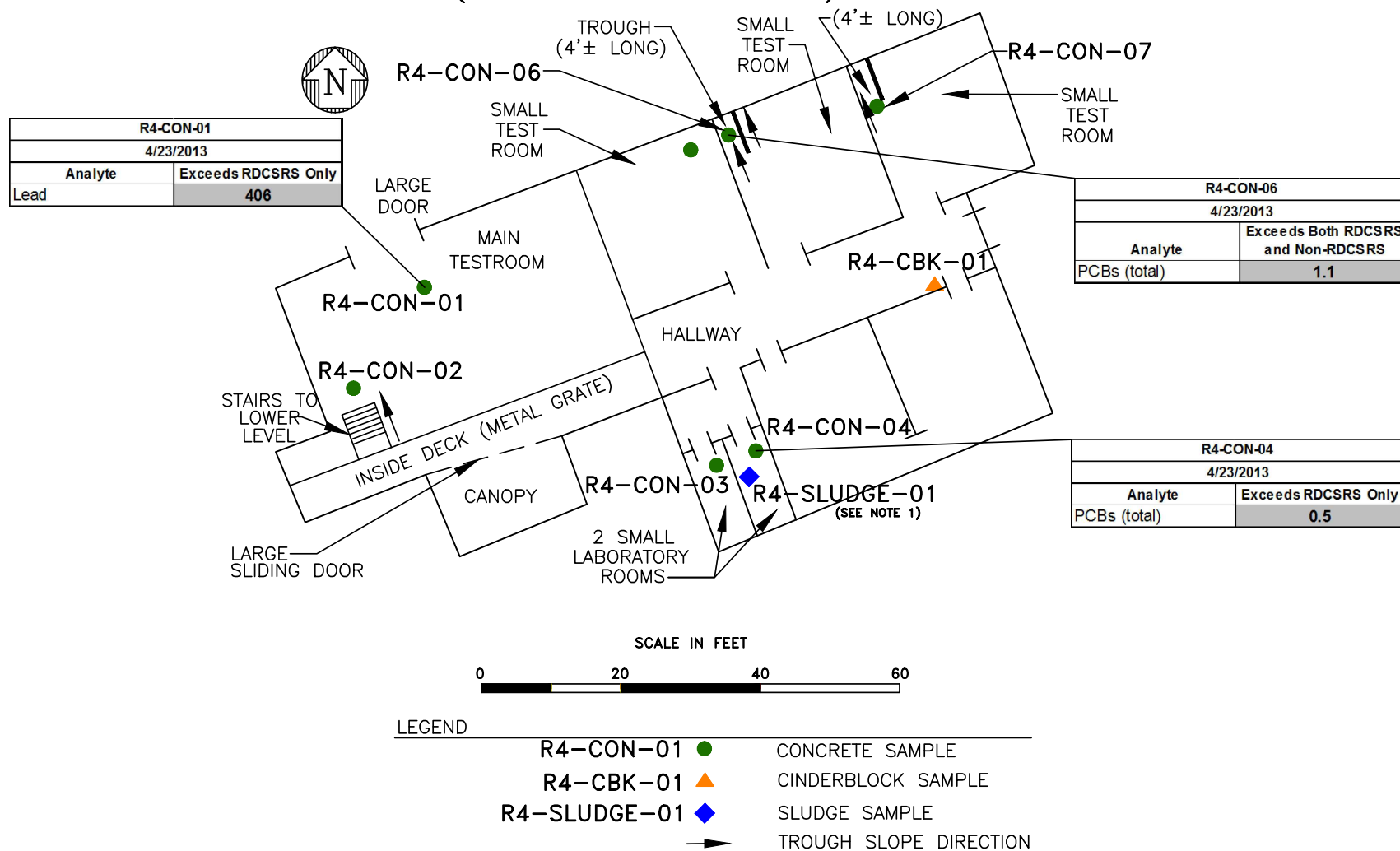
4-85

ecology and environment

FIGURE 4-7 SAMPLE LOCATIONS WITH EXCEEDANCES, R-21 (FORMER DRUG ROOM) RADIATION TECHNOLOGY SUPERFUND SITE, OU3 ROCKAWAY TOWNSHIP, NEW JERSEY

R2-0001900

TEST STAND 4 R-4 (EAST STAND AREA)



NOTE

1. SLUDGE BUCKET WAS PREVIOUSLY REMOVED FROM LOCATION BY USEPA TEAM. THEREFORE, NO SAMPLE WAS COLLECTED AT R4-SLUDGE-01 LOCATION.
2. SAMPLE CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).

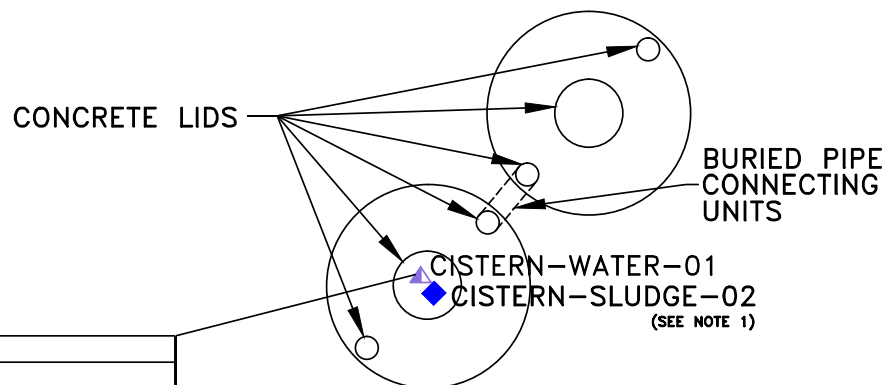
FIGURE 4-8

SAMPLE LOCATIONS WITH EXCEEDANCES, R-4
RADIATION TECHNOLOGY SUPERFUND SITE, OU3
ROCKAWAY TOWNSHIP, NEW JERSEY

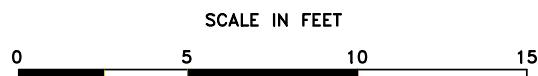
R2-0001901



CISTERN/CISTERN PUMP (EAST STAND AREA)



CISTERN-WATER-01		
4/26/2013		
Analyte	Exceeds Both SWQC-FW2 Acute & Chronic	Exceeds SQQC-FW2 Chronic
Chromium	0.314 J	-
Lead	-	0.0147
PCBs (total)	-	0.0036
CISTERN-WATER-R8		
4/26/2013		
Analyte	Exceeds Both SWQC-FW2 Acute & Chronic	Exceeds SQQC-FW2 Chronic
Chromium	0.0453 J	-
Lead	-	0.0062
gamma-Chlordane	-	0.000083 NJ
PCBs (total)	-	0.0057 NJ



LEGEND

CISTERN-SLUDGE-01	◆	SLUDGE SAMPLE
CISTERN-WATER-01	▲	WATER SAMPLE
NJ		ANALYTE IS "TENTATIVELY IDENTIFIED", VALUE IS AN APPROXIMATE CONCENTRATION.
J		ESTIMATED VALUE

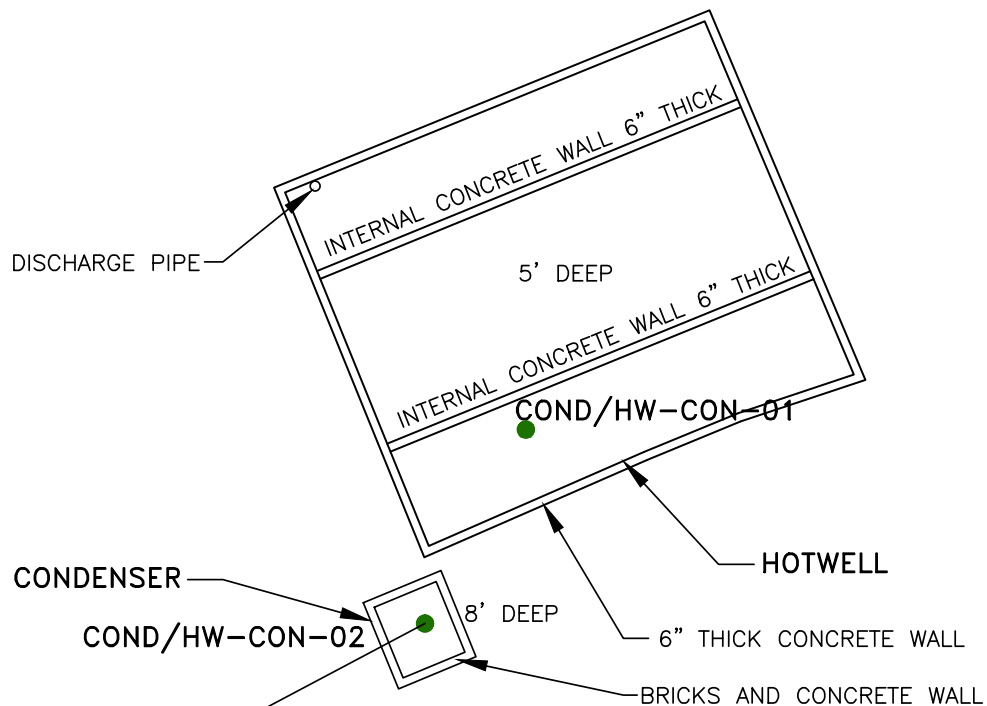
NOTES

1. NO SLUDGE ENCOUNTERED IN EITHER CISTERN, THEREFORE, NO SAMPLE WAS COLLECTED.
2. DUPLICATE SAMPLE (CISTERN-WATER-R8) COLLECTED FROM CISTERN-WATER-01 LOCATION.
3. SAMPLE CONCENTRATIONS IN MILLIGRAMS PER LITER (mg/L).

4-87



CONDENSER AND HOTWELL (EAST STAND AREA)



COND/HW-CON-02	
4/23/2013	
Analyte	Exceeds RDCSRS Only
PCBs (total)	0.21



LEGEND

HOTWELL-CON-01 ● CONCRETE SAMPLE

NOTE

1. SAMPLE CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).

5

Data Assessment

5.1 Screening Level Risk Assessment

5.1.1 Background

Contamination of soil and groundwater at the RTI site was investigated and evaluated as part of other OUs established for the site. This RI is limited to residual contamination of the remaining buildings and other structures that constitute OU3. Accordingly, the environmental sampling conducted as part of the RI for OU3 focused on these objects. Samples of concrete, cinder block, caulk and other materials were collected as described in Section 2.3. These samples were analyzed for hazardous substances, including metals, SVOCs, pesticides and PCBs. Generally these samples are bulk materials consisting of pulverized chips or intact pieces (caulk) of these materials. In situ, these are solid, consolidated materials, only the surfaces of which would be available for direct contact by human receptors that might enter or use the site for various purposes. These bulk samples are not materials that might adhere to receptor's skin or which receptors might inadvertently ingest as a result of hand-to-mouth contact, or which might become airborne, as a result of either volatile or particulate emissions, where they might be inhaled. These bulk samples do not realistically represent exposure media to which potential receptors might be exposed in the ways they might be exposed to soil or water, therefore, they cannot be used to derive meaningful exposure point concentrations for the intact structures from which base line risk estimates, reflecting existing conditions, could be derived. The available samples provide reasonable estimates of exposure point concentrations that might be encountered in the future if the buildings and structures were demolished, broken up, and the debris left on site. Because of these data limitations, only a screening level risk assessment reflecting potential future risks was possible. In addition, the migration of contaminant compounds and elements, chemical persistence and behavioral characteristics of those compounds and elements could not be determined. Therefore, a fate and transport discussion could be completed.

Because of the age of the structures remaining at the site, the presence of ACM and LBP was considered likely. In addition, previous surveys for ACM and LBP at the site confirmed their presence. Therefore, ACM and LBP surveys were conducted as part of the RI. A report describing these surveys and their results is included in Appendix B.

5.1.2 Conceptual Site Model

The site has been unused for a number of years. Most of the remaining buildings and structures are in a dilapidated condition. General categories of potential future uses to be considered are residential, commercial/industrial, and recreational. Historic preservation of some of the structures is also a possibility. Because potential future uses of the site are uncertain, only generic, default exposure scenarios have been considered in this screening risk evaluation.

5.1.3 Risk Assessment Methodology

Hazardous substance concentrations found in the various bulk samples (i.e., concrete, cinder block, and caulk) were compared with Risk-Based Screening Levels for Residential and Industrial Soil from EPA's Regional Screening Tables from May 2013 (EPA 2013a). Derivation of the screening levels is documented in EPA's Regional Screening Table User's Guide (May 2013) (EPA 2013b). Screening levels corresponding to target cancer risks (TCR) of 1E-6 and non-cancer THI of 0.1 and 1.0 were considered. Contaminant concentrations also were compared with Removal Management Screening Levels (EPA 2012) corresponding to a TCR of 1E-4 and a THI of 3 for residential receptors. Removal Management Screening Levels are considered when determining whether a Removal Action may be warranted. The Removal Management Screening Levels used were calculated from the residential soil screening levels given in the May 2013 Regional Screening Tables with suitable adjustments to TCR (1E-4) and THI (3.0).

None of these Risk-based Screening Levels addressed ecological risk. The lack of viable habitat and the lack of complete ecological species exposure pathways are the basis for concluding there is not significant ecological risk from buildings/structures comprising OU3 (and that the remedies would therefore be protective of ecological risk).

Results of the ACM and LBP surveys were assessed in accordance with applicable regulations as described in Appendix B.

5.1.4 Results Hazardous Substances Investigation

The results of the screening level risk assessment for hazardous substances are provided in Tables 5-1 through 5-3. The various screening levels used in the assessment are provided in columns on the left side of the table. The analytical results for the various samples follow to the right of the screening level columns. The results are formatted to show which values are detected values and which exceed the screening levels (SL) used for the various categories (residential, industrial, removal management). A result is highlighted for exceedance of an SL category when it exceeded any of the SLs listed for that category. Highlighting was applied for the numerically largest SL exceeded. Generally, if a Removal Management SL was exceeded, the SLs for Industrial and Residential Use also was exceeded; if an Industrial SL was exceeded, the Residential SL also was exceeded. Note that a number of detection limit values (non-detected values) exceed some of the screening levels. These do not represent actual exceedances,

rather, they represent a source of uncertainty in the assessment. The detection limits were the standard limits for the analytical methods employed except for instances in which the presence of a high concentration of one contaminant in a sample may have resulted in elevated detection limits for other analytes in that sample.

5.2 Overview of the Hazardous Substances SLRA Results

5.2.1 P-2 Area

R-47

Concrete sample R47-CON-01 and its duplicate sample R47-CON-R7, exceeded Residential SLs for perchlorate, arsenic, cobalt, iron, manganese, 4,4'-DDE, gamma-BHC (Lindane), and gamma-chlordane. These samples also exceeded Removal Management SLs for several PCBs and dieldrin. A second concrete sample, R47-CON-02, and a concrete block sample, R47-CBK-01, exceeded Industrial SLs for several PCBs. The concrete block sample also exceeded Removal Management SLs for arsenic, lead and manganese.

Paint Locker

Industrial SLs were exceeded for arsenic in concrete sample (Paint Locker-CON-01), benzo(a)pyrene in cinder block sample (Paint Locker-CBK-01) and PCBs in caulk sample (Paint Locker-CAULK-01). There were also a number of exceedances of Residential SLs for arsenic, cadmium, cobalt, iron, manganese, and PAHs.

Acid Oxidizer Storage Tank

Residential SLs were exceeded in concrete samples for arsenic, cobalt, iron and manganese.

R-34

Industrial SLs were exceeded for antimony in concrete samples (duplicate sample R34-CON-R6), arsenic (three samples), and iron (R34-CON-01). In addition Residential SLs were exceeded for cobalt, lead, manganese, mercury, and PCBs.

5.2.2 South Stand

Test Stand 12

The Removal Management and Industrial SLs for Aroclor 1254 were exceeded in caulk and concrete samples S12-CAULK-01 and S12-CON-02, respectively. Residential SLs for aluminum, arsenic, cobalt, iron, and manganese were exceeded in the concrete samples.

S-46

The Removal Management SL for Aroclor 1254 was exceeded in the concrete samples S46-CON-01 and S46-CON-02, and the Residential SL for Aroclor 1254 was exceeded in the concrete block and caulk samples S46-CBK-01 and S46-CAULK-01, respectively. The Industrial SL for arsenic was exceeded in two

concrete and cinder block samples and the Industrial SL for mercury in one cinder block sample. Residential SLs were exceeded for aluminum, cobalt, iron, and manganese in concrete and cinder block samples.

Test Stand 11

Industrial SLs were exceeded for arsenic in two concrete samples (S11-CON-01 and S11-CON-R4) and for lead in one concrete sample (S11-CON-01). Residential SLs were exceeded for aluminum, arsenic, cobalt, iron, lead, and manganese in concrete and cinder block samples.

Test Stand 37

Industrial SLs were exceeded for arsenic in three concrete and cinder block samples. Residential SLs were exceeded for aluminum, arsenic, cobalt, iron, manganese, and nickel in concrete and cinder block samples.

S-48

Residential SLs were exceeded for aluminum, arsenic, cobalt, iron, and manganese in concrete samples.

T-50

Residential SLs were exceeded for aluminum, arsenic, cobalt, iron, manganese, benzo(a)anthracene, and Aroclor 1254 in concrete samples.

S-49

The Industrial SL for arsenic was exceeded in one cinder block sample. Residential SLs were exceeded for arsenic, cobalt, iron, manganese, and Aroclor 1254 in concrete and cinder block samples.

5.2.3 East Stand**Test Stand 2**

Residential SLs were exceeded for arsenic, iron, manganese, and Aroclor 1254 in concrete samples.

R-33

The Residential SL for cobalt was exceeded in the concrete sample.

R-29

The Industrial SL for mercury and the Residential SLs for aluminum, arsenic, iron, and manganese were exceeded in the concrete sample.

R-21

The Removal Management SL for Aroclor 1254 was exceeded in the concrete sample R21-CON-01. The Industrial SL for arsenic was exceeded in three concrete and cinder block samples and the Residential SLs for arsenic, cobalt, iron, lead, manganese, nickel, benzo(a)anthracene, and benzo(b)fluoranthene were exceeded in several samples.

Table 5-1 Risk Screening of Detected Analytical Results for P-2 Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	R-47					
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R47-CON-01	R47-CON-02	R47-CON-R7	R47-CBK-01		
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/25/2013	4/25/2013	4/25/2013	4/25/2013	
Perchlorate (mg/kg)															
Perchlorate		55	5.5		720	72		165		20	0.23	J	14	0.35	
Total Metals (mg/kg)															
Aluminum		77000	7700		990000	99000		231000		6,490	6730		6,660	6,100	
Antimony		31	3.1		410	41		93		5.9	U	5.8	U	5.9	U
Arsenic	0.61	34	3.4	2.4	380	38	61	102		1.5	1.9		1.5	96.4	
Barium		15000	1500		190000	19000		45000		43.4	38.3		43.8	364	
Beryllium	1400	160	16	6900	2000	200	140000	480		0.18	J	0.49	U	0.18	J
Cadmium	1800	70	7	9300	800	80	180000	210		5.7	J	2.5		1.9	J
Calcium										75,400	72700		87,400	72,400	
Chromium		120000	12000		1500000	150000		360000		142	18.9		89.1	6.7	
Cobalt	370	23	2.3	1900	300	30	37000	69		13.4	6.7		8.6	5.2	
Copper		3100	310		41000	4100		9300		32.1	J	28.7	13.1	J	
Iron		55000	5500		720000	72000		165000		13,400	12800		11,800	14,500	
Lead		400	40		800	80		1200		24	22.3		17.3	1,410	
Magnesium										3,840	4980		4,120	4,140	
Manganese		1800	180		23000	2300		5400		194	195		201	12,800	
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		11.8	15.5		8.4	9.5	
Potassium										1,830	2160		1,250	756	
Selenium		390	39		5100	510		1170		3.4	U	2.1	J	1.7	J
Silver		390	39		5100	510		1170		0.98	U	0.97	U	0.98	U
Sodium										844	853		603	363	J
Vanadium		390	39		5100	510		1170		12.8	16.4		13	12.9	
Zinc		23000	2300		310000	31000		69000		387	J	109		180	J
Mercury		10	1		43	4.3		30		0.19	0.048	J		0.16	0.13
Semivolatile Organics (mg/kg)															
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		1.7	U	0.17	U	0.0053	J
2-Methylnaphthalene		230	23		2200	220		690		1.7	U	0.1	J	0.012	J
4,6-Dinitro-2-methylphenol		4.9	0.49		49	4.9		14.7		3.3	U	0.33	U	0.33	U
4-Methylphenol		6100	610		62000	6200		18300		1.7	U	0.17	U	0.17	U
Acenaphthylene										1.7	U	0.17	U	0.17	U
Acetophenone		7800	780		100000	10000		23400		0.83	J	0.17	U	0.59	
Anthracene		17000	1700		170000	17000		51000		1.7	U	0.17	U	0.17	U
Benzaldehyde		7800	780		100000	10000		23400		2.2		0.17	U	1.1	
Benzo(a)anthracene	0.15			2.1			15			1.7	U	0.17	U	0.17	U
Benzo(a)pyrene	0.02			0.21			1.5			1.7	U	0.17	U	0.17	U
Benzo(b)fluoranthene	0.15			2.1			15			1.7	U	0.17	U	0.17	U
Benzo(g,h,l)perylene										1.7	U	0.17	U	0.17	U
Benzo(k)fluoranthene	1.5			21			150			1.7	U	0.17	U	0.17	U
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		16		0.17	U	10	
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		2.1		0.17	U	2.3	
Carbazole										1.7	U	0.17	U	0.17	U
Chrysene	15			210			1500			1.7	U	0.17	U	0.17	U
Dibenzofuran		78	7.8		1000	100		234		1.7	U	0.17	U	0.17	U
Diethylphthalate		49000	4900		490000	49000		147000		1.7	U	0.17	U	0.17	U
														0.012	J

Table 5-1 Risk Screening of Detected Analytical Results for P-2 Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	R-47			
	CarcSL	NoncarcSL	NoncarcSL	CarcSL	NoncarcSL	NoncarcSL	CarcSL	NoncarcSL	Sample ID:	R47-CON-01	R47-CON-02	R47-CON-R7	R47-CBK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/25/2013	4/25/2013	4/25/2013	4/25/2013
Dimethylphthalate										28	0.087 J	17	0.17 U
Di-n-butylphthalate		6100	610		62000	6200		18300		3.7	0.17 U	3.7	0.17 U
Di-n-octylphthalate		610	61		6200	620		1830		0.23 J	0.17 U	0.17 U	0.17 U
Fluoranthene		2300	230		22000	2200		6900		0.29 J	0.17 U	0.17 U	0.021 J
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			1.7 U	0.17 U	0.17 U	0.17 U
Naphthalene	3.6	140	14	18	620	62	360	420		1.7 U	0.012 J	0.014 J	0.17 U
PAHs (total)										0.82	0.152	0.014	0.045
Phenanthrene										0.33 J	0.14 J	0.17 U	0.024 J
Pyrene		1700	170		17000	1700		5100		0.2 J	0.17 U	0.17 U	0.17 U
PCBs (mg/kg)													
Aroclor-1248	0.22			0.74			22			680 J	4.4 J	220 J	1.8 J
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		6.6 U	2.7 J	82 J	0.032 U
Aroclor-1260	0.22			0.74			22			6.6 U	0.033 U	6.6 U	0.032 U
PCBs (total)	0.22			0.74			22			680	7.1	302	1.8
Pesticides (mg/kg)													
4,4'-DDE	1.4			5.1			140			3.8 J	0.085 J	2.7 J	0.013 J
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.066 UJ	0.18 J	0.033 U	0.003 U
delta-BHC	0.27			0.96			27			0.034 U	0.0017 UJ	0.017 UJ	0.011 J
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		4.4 J	0.11 J	3.2 J	0.013 NJ
Endosulfan sulfate		370	37		3700	370		1110		0.066 U	0.045 J	0.033 UJ	0.003 UJ
gamma-BHC (Lindane)	0.52	21	2.1	2.1	240	24	52	63		0.46 J	0.0071 J	0.79	0.007 J
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		3.7 NJ	0.098 NJ	2.7 NJ	0.014 NJ
Methoxychlor		310	31		3100	310		930		0.34 UJ	0.017 UJ	0.17 U	0.017 U

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

Bold face type indicates detected values
Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-1 Risk Screening of Detected Analytical Results for P-2 Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Paint Locker			Acid Oxidizer Storage Tank	
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	Paintlocker- CON	Paintlocker-CBK-	Paintlocker-CAULK-01	ACID/OX-CON-01	ACID/OX-CON-02
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013
Perchlorate (mg/kg)														
Perchlorate		55	5.5		720	72		165		0.3	0.012		0.00042 J	0.00068
Total Metals (mg/kg)														
Aluminum		77000	7700		990000	99000		231000		3,930	7,570		7,050	7,650
Antimony		31	3.1		410	41		93		5.8 U	5.9 U		5.8 U	5.9 U
Arsenic	0.61	34	3.4	2.4	380	38	61	102		3	0.76 J		0.91 J	1
Barium		15000	1500		190000	19000		45000		45.4	33.5		33.9	36.7
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U	0.5 U		0.49 U	0.49 U
Cadmium	1800	70	7	9300	800	80	180000	210		0.15 J	21.3		0.22 J	0.21 J
Calcium										40,400	79,500		65,400	39,700
Chromium		120000	12000		1500000	150000		360000		6.7	31.3		11.6	73.1
Cobalt	370	23	2.3	1900	300	30	37000	69		3.3 J	8.4		5.9	9.9
Copper		3100	310		41000	4100		9300		22.3	22.3		16.3	20.7
Iron		55000	5500		720000	72000		165000		9,360	12,500		10,600	12,300
Lead		400	40		800	80		1200		19.6	10.2		6.2	6.5
Magnesium										1,970	5,060		4,530	8,150
Manganese		1800	180		23000	2300		5400		146	199		229	164
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		7.1	11.9		41.4	40.5
Potassium										1,030	2,910		733	4550
Selenium		390	39		5100	510		1170		1.9 J	2 J		1.7 J	2.1 J
Silver		390	39		5100	510		1170		0.97 U	0.99 U		0.97 U	0.98 U
Sodium										273 J	1520		156 J	150 J
Vanadium		390	39		5100	510		1170		10.2	17.2		15.2	20.8
Zinc		23000	2300		310000	31000		69000		29	168		64.2	33
Mercury		10	1		43	4.3		30		0.22	0.14		0.0074 J	0.016 J
Semivolatile Organics (mg/kg)														
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 UJ	0.17 U	0.17 U	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.0086 J	0.17 U	0.17 U	0.17 U
4,6-Dinitro-2-methylphenol		4.9	0.49		49	4.9		14.7		0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
4-Methylphenol		6100	610		62000	6200		18300		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Acenaphthylene										0.17 U	0.021 J	0.17 U	0.17 U	0.17 U
Acetophenone		7800	780		100000	10000		23400		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Anthracene		17000	1700		170000	17000		51000		0.17 U	0.15 J	0.17 U	0.17 U	0.17 U
Benzaldehyde		7800	780		100000	10000		23400		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.79	0.17 U	0.17 U	0.17 U
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U	0.3 J	0.17 U	0.17 U	0.17 U
Benzo(b)fluoranthene	0.15			2.1			15			0.17 UJ	0.42 J	0.17 U	0.17 U	0.17 U
Benzo(g,h,I)perylene										0.17 UJ	0.18	0.17 U	0.17 U	0.17 U
Benzo(k)fluoranthene	1.5			21			150			0.17 U	0.39 J	0.17 UJ	0.17 U	0.17 UJ
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		1.9	0.17 UJ	0.17 U	0.17 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 J	0.17 UJ	0.17 U	0.17 U	0.17 U
Carbazole										0.17 U	0.005 J	0.17 U	0.17 U	0.17 U
Chrysene	15			210			1500			0.17 U	0.9	0.17 U	0.17 U	0.17 U
Dibenzofuran		78	7.8		1000	100		234		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		0.008 J	0.02 J	0.019 J	0.17 U	0.17 U

Table 5-1 Risk Screening of Detected Analytical Results for P-2 Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Paint Locker			Acid Oxidizer Storage Tank		
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	Paintlocker- CON	Paintlocker-CBK-	Paintlocker-CAULK-01	ACID/OX-CON-01	ACID/OX-CON-02	
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/25/2013	4/25/2013	4/25/2013	4/25/2013	4/25/2013	
Dimethylphthalate										1.3	0.17 UJ	0.17 U	0.17 U	0.17 U	
Di-n-butylphthalate		6100	610		62000	6200		18300		0.43	0.17 UJ	0.17 U	0.17 U	0.17 U	
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 UJ	0.17 U	0.0087 J	0.17 U	
Fluoranthene		2300	230		22000	2200		6900		0.003 J	2.6	0.008 J	0.17 U	0.17 U	
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			0.17 UJ	0.21	0.17 U	0.17 U	0.17 U	
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.011 J	0.004 J	0.17 U	0.17 U	
PAHs (total)										0.011 J	8.092	0.026 J	0.17 U	0.17 UJ	
Phenanthrene										0.008 J	0.22	0.014 J	0.17 U	0.17 U	
Pyrene		1700	170		17000	1700		5100		0.17 U	1.9	0.17 U	0.17 U	0.17 U	
PCBs (mg/kg)															
Aroclor-1248	0.22			0.74			22			0.036	0.15 J	2 J	0.033 U	0.033 U	
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.033 U	0.033 U	0.033 U	0.048	0.033 U	
Aroclor-1260	0.22			0.74			22			0.033 U	0.033 U	0.033 U	0.033 U	0.033 U	
PCBs (total)	0.22			0.74			22			0.036	0.15	2	0.048	0.033 U	
Pesticides (mg/kg)															
4,4'-DDE	1.4			5.1			140			0.001 J	0.0033 UJ		0.0019 J	0.003 UJ	
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003 UJ	0.0033 UJ		0.0033 UJ	0.003 UJ	
delta-BHC	0.27			0.96			27			0.001 UJ	0.0017 UJ		0.0017 UJ	0.001 UJ	
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003 UJ	0.0033 UJ		0.0033 UJ	0.003 UJ	
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ	0.0033 UJ		0.0033 UJ	0.003 UJ	
gamma-BHC (Lindane)	0.52	21	2.1	2.1	240	24	52	63		0.001 UJ	0.0017 UJ		0.0017 UJ	0.001 UJ	
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.001 UJ	0.0017 UJ		0.0028 J	0.001 UJ	
Methoxychlor		310	31		3100	310		930		0.017 UJ	0.017 UJ		0.0033 J	0.017 UJ	

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-1 Risk Screening of Detected Analytical Results for P-2 Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location: R-34				
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R34-CON-01	R34-CON-02	R34-CON-R6	R34-CBK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/25/2013	4/25/2013	4/25/2013	4/25/2013
Perchlorate (mg/kg)													
Perchlorate		55	5.5		720	72		165		0.00037 J	0.024 J	0.01 J	0.00057
Total Metals (mg/kg)													
Aluminum		77000	7700		990000	99000		231000		7,260	8,760	8,230	4,660
Antimony		31	3.1		410	41		93		5.8 U	5.9 J	57.5 J	5.9 U
Arsenic	0.61	34	3.4	2.4	380	38	61	102		9.1	2.8	4.1	1.9
Barium		15000	1500		190000	19000		45000		71.4	58.4	51.6	55.5
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U	0.26 J	0.25 J	0.49 U
Cadmium	1800	70	7	9300	800	80	180000	210		1.2	0.75	1.2	0.14 J
Calcium										98,500	69,200	73,800	69,000
Chromium		120000	12000		1500000	150000		360000		23.7	14.4	15.7	14.6
Cobalt	370	23	2.3	1900	300	30	37000	69		10	9.2	10.3	6.1
Copper		3100	310		41000	4100		9300		38.2	13.1	18.7	12.2
Iron		55000	5500		720000	72000		165000		72,400	19,000	21,700	4,520
Lead		400	40		800	80		1200		24.6	43.6	63.7	69.1
Magnesium										13,000	4,730	5,420	2,640
Manganese		1800	180		23000	2300		5400		519	335	284	84.6
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		26	14.6	15.4	8.5
Potassium										1540	1140	1030	922
Selenium		390	39		5100	510		1170		8.8	3.1 J	3.7	0.65 J
Silver		390	39		5100	510		1170		0.97 U	0.98 U	0.97 U	0.98 U
Sodium										256 J	249 J	219 J	269 J
Vanadium		390	39		5100	510		1170		18.3	15	15.8	14.4
Zinc		23000	2300		310000	31000		69000		162	269	405	38.2
Mercury		10	1		43	4.3		30		0.66	1.7	1	5.7
Semivolatile Organics (mg/kg)													
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.0069 J	0.17 U	0.17 U	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		0.034 J	0.17 U	0.17 U	0.4 NJ
4,6-Dinitro-2-methylphenol		4.9	0.49		49	4.9		14.7		0.33 U	0.33 U	0.33 U	0.33 U
4-Methylphenol		6100	610		62000	6200		18300		0.08 J	0.17 U	0.17 U	0.17 U
Acenaphthylene										0.17 U	0.17 U	0.17 U	0.17 U
Acetophenone		7800	780		100000	10000		23400		0.17 U	0.17 U	0.17 U	0.17 U
Anthracene		17000	1700		170000	17000		51000		0.17 U	0.17 U	0.17 U	0.17 U
Benzaldehyde		7800	780		100000	10000		23400		0.17 U	0.17 U	0.17 U	0.17 U
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.17 U	0.17 U	0.17 U
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U	0.17 U	0.17 U	0.17 U
Benzo(b)fluoranthene	0.15			2.1			15			0.17 U	0.17 U	0.17 U	0.17 U
Benzo(g,h,i)perylene										0.17 U	0.17 U	0.17 U	0.17 U
Benzo(k)fluoranthene	1.5			21			150			0.17 U	0.17 U	0.17 U	0.17 U
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		0.17 U	0.17 U	0.17 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.17 U	0.17 U	0.17 U
Carbazole										0.17 U	0.17 U	0.17 U	0.17 U
Chrysene	15			210			1500			0.17 U	0.17 U	0.17 U	0.17 U
Dibenzofuran		78	7.8		1000	100		234		0.01 J	0.17 U	0.17 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	0.17 U	0.05 J

Table 5-1 Risk Screening of Detected Analytical Results for P-2 Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location: R-34				
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R34-CON-01	R34-CON-02	R34-CON-R6	R34-CBK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date: 4/25/2013	4/25/2013	4/25/2013	4/25/2013
Dimethylphthalate										0.17 U	0.17 U	0.17 U	0.17 U
Di-n-butylphthalate		6100	610		62000	6200		18300		0.17 U	0.17 U	0.17 U	0.25
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 U	0.17 U	0.011 J
Fluoranthene		2300	230		22000	2200		6900		0.17 U	0.17 U	0.17 U	0.17 U
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			0.17 U	0.17 U	0.17 U	0.17 U
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	0.17 U	0.26
PAHs (total)										0.05	0.17 U	0.021	0.288
Phenanthrene										0.05 J	0.17 U	0.17 U	0.028 J
Pyrene		1700	170		17000	1700		5100		0.17 U	0.17 U	0.021 J	0.17 U
PCBs (mg/kg)													
Aroclor-1248	0.22			0.74			22			0.032 U	0.043	0.063	0.032 U
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.032 U	0.033 U	0.093 J	0.23
Aroclor-1260	0.22			0.74			22			0.2	0.033 U	0.033 U	0.032 U
PCBs (total)	0.22			0.74			22			0.2	0.043	0.156	0.23
Pesticides (mg/kg)													
4,4'-DDE	1.4			5.1			140			0.032 J	0.0044 J	0.0033 UJ	0.0084 J
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.0032 UJ	0.0033 UJ	0.0033 UJ	0.011 NJ
delta-BHC	0.27			0.96			27			0.0017 UJ	0.0017 UJ	0.0017 UJ	0.0017 UJ
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.0057 NJ	0.0049 NJ	0.0037 NJ	0.007 NJ
Endosulfan sulfate		370	37		3700	370		1110		0.02 UJ	0.0041 J	0.0064 NJ	0.0032 UJ
gamma-BHC (Lindane)	0.52	21	2.1	2.1	240	24	52	63		0.0017 UJ	0.0017 UJ	0.0017 UJ	0.0017 UJ
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.009 R	0.0066 J	0.0056 J	0.0091 NJ
Methoxychlor		310	31		3100	310		930		0.017 UJ	0.017 UJ	0.017 UJ	0.014 J

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 12		
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S12-CON-01	S12-CON-02	S12-CAULK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/25/2013	4/25/2013	4/25/2013
Perchlorate (mg/kg)												
Perchlorate		55	5.5		720	72		165		0.011	0.076	
Total Metals (mg/kg)												
Aluminum		77000	7700		990000	99000		231000		8,060	8,340	
Arsenic	0.61	34	3.4	2.4	380	38	61	102		0.9 J	2.3	
Barium		15000	1500		190000	19000		45000		40.2	54.5	
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U	0.49 U	
Cadmium	1800	70	7	9300	800	80	180000	210		0.95	2.6	
Calcium										69,100	84,200	
Chromium		120000	12000		1500000	150000		360000		13.1	14.7	
Cobalt	370	23	2.3	1900	300	30	37000	69		4.9 U	5.1	
Copper		3100	310		41000	4100		9300		12.6	19.1	
Iron		55000	5500		720000	72000		165000		9,060	14,800	
Lead		400	40		800	80		1200		9.7	9.9	
Magnesium										3,960	3,160	
Manganese		1800	180		23000	2300		5400		161	280	
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		12.2	10.5	
Potassium										1,060	1,260	
Selenium		390	39		5100	510		1170		1.5 J	2.5 J	
Sodium										130 J	773	
Vanadium		390	39		5100	510		1170		13.1	14.6	
Zinc		23000	2300		310000	31000		69000		37.9	169	
Mercury		10	1		43	4.3		30		0.096 U	0.032 J	
Semivolatile Organics (mg/kg)												
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	0.17 U
3,3'-Dichlorobenzidine	1.1			3.8			110			0.17 U	0.17 U	0.17 U
Anthracene		17000	1700		170000	17000		51000		0.17 U	0.17 U	0.17 U
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.17 U	0.17 U
Benzo(a)pyrene	0.02			0.21			1.5			0.019 J	0.17 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.17 U	0.17 U
Carbazole										0.17 U	0.17 U	0.17 U
Chrysene	15			210			1500			0.17 U	0.17 U	0.17 U
Dibenzofuran		78	7.8		1000	100		234		0.17 U	0.17 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	0.17 U
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.01 J	0.17 U
Fluoranthene		2300	230		22000	2200		6900		0.17 U	0.17 U	0.17 U
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	0.17 U
N-Nitrosodiphenylamine	99			350			9900			0.17 U	0.17 U	0.17 U
PAHs (total)										0.019	0.17 U	0.028
Phenanthrene										0.17 U	0.17 U	0.028 J
Pyrene		1700	170		17000	1700		5100		0.17 U	0.17 U	0.17 U

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 12		
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S12-CON-01	S12-CON-02	S12-CAULK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/25/2013	4/25/2013	4/25/2013
PCBs (mg/kg)												
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.032 U	1.3 J	49 J
PCBs (total)	0.22			0.74			22			0.032 U	1.3	49
Pesticides (mg/kg)												
4,4'-DDE	1.4			5.1			140			0.0032 UJ	0.027 NJ	
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.0032 UJ	0.0033 UJ	
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.0032 UJ	0.025 NJ	
Endosulfan II		370	37		3700	370		1110		0.0032 UJ	0.023 J	
Endosulfan sulfate		370	37		3700	370		1110		0.0032 UJ	0.0096 J	
Endrin aldehyde	18			180			1800			0.0032 UJ	0.017 U	
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.0017 UJ	0.037 J	

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	S-46				
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S46-CON-01		S46-CON-02	S46-CBK-01	S46-CAULK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013	4/24/2013	4/24/2013	4/24/2013
Perchlorate (mg/kg)														
Perchlorate		55	5.5		720	72		165		0.1	0.051	0.01		
Total Metals (mg/kg)														
Aluminum		77000	7700		990000	99000		231000		8,630	8,140	5,120		
Arsenic	0.61	34	3.4	2.4	380	38	61	102		3.1	1	3.6		
Barium		15000	1500		190000	19000		45000		284	57.7	47.5		
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U	0.49 U	0.2 J		
Cadmium	1800	70	7	9300	800	80	180000	210		5.7	1	0.49 U		
Calcium										123,000	89,500	64,500		
Chromium		120000	12000		1500000	150000		360000		32	14.6	6.9		
Cobalt	370	23	2.3	1900	300	30	37000	69		7.6	5.4	4.5 J		
Copper		3100	310		41000	4100		9300		27.8	26.3	15.8		
Iron		55000	5500		720000	72000		165000		17,500	10,200	5,410		
Lead		400	40		800	80		1200		44.2	19.7	19.1		
Magnesium										17,100	6,650	2,560		
Manganese		1800	180		23000	2300		5400		307	241	122		
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		20.3	10.4	9.1		
Potassium										2,530	2,540	1,470		
Selenium		390	39		5100	510		1170		3.4 U	3.4 U	0.82 J		
Sodium										1,750	2,980	495		
Vanadium		390	39		5100	510		1170		24.2	13.8	12		
Zinc		23000	2300		310000	31000		69000		410	60.6	17.4		
Mercury		10	1		43	4.3		30		2.7	0.076 J	8.1		
Semivolatile Organics (mg/kg)														
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		5 U	1.7 U	0.012 J	0.17 U	
2-Methylnaphthalene		230	23		2200	220		690		5 U	1.7 U	0.17	0.17 U	
3,3'-Dichlorobenzidine	1.1			3.8			110			5 U	1.7 U	0.17 U	0.17 U	
Anthracene		17000	1700		170000	17000		51000		5 U	1.7 U	0.17 U	0.17 U	
Benzo(a)anthracene	0.15			2.1			15			5 U	1.7 U	0.17 U	0.17 U	
Benzo(a)pyrene	0.02			0.21			1.5			5 U	1.7 U	0.17 U	0.17 U	
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		5 U	2.3	0.073 J	0.17 U	
Carbazole										5 U	0.05 J	0.17 U	0.17 U	
Chrysene	15			210			1500			5 U	1.7 U	0.17 U	0.17 U	
Dibenzofuran		78	7.8		1000	100		234		5 U	1.7 U	0.005 J	0.17 U	
Diethylphthalate		49000	4900		490000	49000		147000		5 U	1.7 U	0.067 J	0.012 J	
Di-n-octylphthalate		610	61		6200	620		1830		0.24 J	1.7 U	0.17 U	0.17 U	
Fluoranthene		2300	230		22000	2200		6900		5 U	0.41 J	0.018 J	0.024 J	
Naphthalene	3.6	140	14	18	620	62	360	420		5 U	1.7 U	0.26	0.17 U	
N-Nitrosodiphenylamine	99			350			9900			5 U	1.7 U	0.17 U	0.01 J	
PAHs (total)										5 U	0.92	0.321 J	0.054	
Phenanthrene										5 U	0.2 J	0.029 J	0.03 J	
Pyrene		1700	170		17000	1700		5100		5 U	0.31 J	0.014 J	0.17 U	

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	S-46			
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S46-CON-01	S46-CON-02	S46-CBK-01	S46-CAULK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013	4/24/2013	4/24/2013
PCBs (mg/kg)													
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		65 J	65 J	0.64 J	0.5 J
PCBs (total)	0.22			0.74			22			65 J	65 J	0.64	0.5
Pesticides (mg/kg)													
4,4'-DDE	1.4			5.1			140			1.9 J	1.7 J	0.018 J	
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003 R	0.003 R	0.003 U	
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		2.7 NJ	2 NJ	0.016 NJ	
Endosulfan II		370	37		3700	370		1110		0.003 R	0.003 R	0.003 UJ	
Endosulfan sulfate		370	37		3700	370		1110		0.003 R	0.003 R	0.003 UJ	
Endrin aldehyde	18			180			1800			0.003 R	0.003 R	0.003 UJ	
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		3.6		0.11 R	0.026 J

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

Bold face type indicates detected values

Red Highlighting indicates value exceeds one or more Removal Management Screening Level.

Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.

Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location: Sample ID:	Test Stand 11			
	CarcSL TR=1E-6	Noncarc SL THI=1.0	Noncarc SL THI=0.1	CarcSL TR=1E-6	Noncarc SL THI=1.0	Noncarc SL THI=0.1	CarcSL TR=1E-4	Noncarc SL THI=3.0		S11-CON-01	S11-CON-R4	S11-CON-02	S11-CBK-01
									Date:	4/24/2013	4/24/2013	4/24/2013	4/24/2013
Perchlorate (mg/kg)													
Perchlorate		55	5.5		720	72		165		0.03	0.086 J	0.0033 J	0.0024
Total Metals (mg/kg)													
Aluminum		77000	7700		990000	99000		231000		9,070	7,650	5,950	5,910
Arsenic	0.61	34	3.4	2.4	380	38	61	102		7.1	5.9	2.2	1
Barium		15000	1500		190000	19000		45000		70.9	64.8	37.6	108
Beryllium	1400	160	16	6900	2000	200	140000	480		0.2 J	0.17 J	0.49 U	0.49 U
Cadmium	1800	70	7	9300	800	80	180000	210		2.1	1.8	0.25 J	1.9
Calcium										64,900	71,500	63,400	63,400
Chromium		120000	12000		1500000	150000		360000		105	87.1	8.7	10.4
Cobalt	370	23	2.3	1900	300	30	37000	69		6.6	6.9	3.9 J	6.9
Copper		3100	310		41000	4100		9300		135	118	11.9	23.2
Iron		55000	5500		720000	72000		165000		52,300	56300	11,300	6,650
Lead		400	40		800	80		1200		95.1	76	5.7	4.7
Magnesium										3,480	3,480	2,680	2,980
Manganese		1800	180		23000	2300		5400		429	440	160	90.6
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		96.4	151	7.7	12.5
Potassium										719	723	2,600	978
Selenium		390	39		5100	510		1170		3.4 U	3.4 U	3.4 U	3.4 U
Sodium										226 J	213 J	910	197 J
Vanadium		390	39		5100	510		1170		25.5	24.4	11.6	21.8
Zinc		23000	2300		310000	31000		69000		205	204	31.5	36.3
Mercury		10	1		43	4.3		30		0.2	0.12	0.0077 J	0.012 J
Semivolatile Organics (mg/kg)													
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	0.17 U	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	0.17 U	0.17 U
3,3'-Dichlorobenzidine	1.1			3.8			110			0.17 U	0.17 U	0.17 U	0.17 U
Anthracene		17000	1700		170000	17000		51000		0.005 J	0.007 J	0.17 U	0.17 U
Benzo(a)anthracene	0.15			2.1			15			0.05 J	0.065 J	0.17 U	0.17 U
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U	0.17 U	0.17 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.006 J	0.17 U	0.17 U
Carbazole										0.006 J	0.007 J	0.17 U	0.17 U
Chrysene	15			210			1500			0.12 J	0.15 J	0.17 U	0.17 U
Dibenzofuran		78	7.8		1000	100		234		0.17 U	0.17 U	0.17 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	0.17 U	0.17 U
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 U	0.17 U	0.17 U
Fluoranthene		2300	230		22000	2200		6900		0.21	0.24	0.17 U	0.005 J
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	0.17 U	0.17 U
N-Nitrosodiphenylamine	99			350			9900			0.17 U	0.17 U	0.17 U	0.17 U
PAHs (total)										0.567 J	0.681 J	0.17 U	0.009 J
Phenanthrene										0.032 J	0.039 J	0.17 U	0.004 J
Pyrene		1700	170		17000	1700		5100		0.15 J	0.18	0.17 U	0.17 U

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 11			
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S11-CON-01	S11-CON-R4	S11-CON-02	S11-CBK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013	4/24/2013	4/24/2013
PCBs (mg/kg)													
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.033 UJ	0.033 UJ	0.033 UJ	0.032 UJ
PCBs (total)	0.22			0.74			22			0.033 UJ	0.033 UJ	0.033 UJ	0.032 UJ
Pesticides (mg/kg)													
4,4'-DDE	1.4			5.1			140			0.003 UJ	0.003 UJ	0.003 UJ	0.003 U
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003 U	0.003 U	0.003 U	0.003 UJ
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003 U	0.003 U	0.003 U	0.003 UJ
Endosulfan II		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.003 U
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.003 U
Endrin aldehyde	18			180			1800			0.003 UJ	0.003 UJ	0.003 UJ	0.003 U
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.001 UJ	0.001 UJ	0.001 UJ	0.001 U

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

Bold face type indicates detected values

Red Highlighting indicates value exceeds one or more Removal Management Screening Level.

Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.

Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location: Sample ID:	Test Stand 37			
	CarcSL TR=1E-6	Noncarc SL THI=1.0	Noncarc SL THI=0.1	CarcSL TR=1E-6	Noncarc SL THI=1.0	Noncarc SL THI=0.1	CarcSL TR=1E-4	Noncarc SL THI=3.0		S37-CON-01	S37-CON-R5	S37-CON-02	S37-CBK-01
									Date:	4/24/2013	4/24/2013	4/24/2013	4/24/2013
Perchlorate (mg/kg)													
Perchlorate		55	5.5		720	72		165		0.015	0.019	0.002 J	0.0015
Total Metals (mg/kg)													
Aluminum		77000	7700		990000	99000		231000		8,050	8,370	6,850	4,810
Arsenic	0.61	34	3.4	2.4	380	38	61	102		6.5	4	1.7	6.6
Barium		15000	1500		190000	19000		45000		53.2	54.2	41.9	78.2
Beryllium	1400	160	16	6900	2000	200	140000	480		0.21 J	0.2 J	0.49 U	0.49 U
Cadmium	1800	70	7	9300	800	80	180000	210		1.1	0.66	3.5	0.78
Calcium										81,700	107,000	86,600	41,400
Chromium		120000	12000		1500000	150000		360000		135	58.6	10.7	10.1
Cobalt	370	23	2.3	1900	300	30	37000	69		7.5	6.1	3.6 J	4.4 J
Copper		3100	310		41000	4100		9300		99.9	48.4	9	32.5
Iron		55000	5500		720000	72000		165000		59,400	38,200	12,300	8,620
Lead		400	40		800	80		1200		12.1	9.8	4.9	22.1
Magnesium										2,750	2,930	2,880	2,210
Manganese		1800	180		23000	2300		5400		443	334	177	248
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		270	149	8.5	10.2
Potassium										678	694	3,360	708
Selenium		390	39		5100	510		1170		3.4 U	3.4 U	3.4 U	3.4 U
Sodium										126 J	141 J	2010	109 J
Vanadium		390	39		5100	510		1170		23.2	23	12.7	17.3
Zinc		23000	2300		310000	31000		69000		86.5	75.6	31.3	287
Mercury		10	1		43	4.3		30		0.019 J	0.013 J	0.0067 J	0.046 J
Semivolatile Organics (mg/kg)													
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	0.17 U	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	0.17 U	0.17 U
3,3'-Dichlorobenzidine	1.1			3.8			110			0.17 U	0.17 U	0.17 U	0.17 U
Anthracene		17000	1700		170000	17000		51000		0.17 U	0.17 U	0.17 U	0.17 U
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.009 J	0.17 U	0.17 U
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U	0.17 U	0.17 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.003 J	0.17 U	0.17 U
Carbazole										0.17 U	0.17 U	0.17 U	0.17 U
Chrysene	15			210			1500			0.17 U	0.012 J	0.17 U	0.17 U
Dibenzofuran		78	7.8		1000	100		234		0.17 U	0.17 U	0.17 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.003 J	0.17 U	0.17 U
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 U	0.17 U	0.17 U
Fluoranthene		2300	230		22000	2200		6900		0.17 U	0.018 J	0.17 U	0.17 U
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	0.17 U	0.17 U
N-Nitrosodiphenylamine	99			350			9900			0.17 U	0.17 U	0.17 U	0.17 U
PAHs (total)										0.17 UJ	0.066 J	0.17 UJ	0.17 UJ
Phenanthrene										0.17 U	0.009 J	0.17 U	0.17 U
Pyrene		1700	170		17000	1700		5100		0.17 U	0.018 J	0.17 U	0.17 U

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 37			
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S37-CON-01	S37-CON-R5	S37-CON-02	S37-CBK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013	4/24/2013	4/24/2013
PCBs (mg/kg)													
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.028 J	0.021 J	0.033 U	0.033 U
PCBs (total)	0.22			0.74			22			0.028 J	0.021 J	0.033 U	0.033 U
Pesticides (mg/kg)													
4,4'-DDE	1.4			5.1			140			0.003 UJ	0.003 UJ	0.003 U	0.003 U
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003 U	0.003 U	0.003 U	0.003 U
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003 U	0.003 U	0.003 U	0.003 U
Endosulfan II		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 U	0.003 U
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 U	0.003 U
Endrin aldehyde	18			180			1800			0.003 UJ	0.003 UJ	0.003 U	0.003 U
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.002 NJ	0.001 J	0.001 U	0.001 J

Key:

- J = Estimated value.
- R - Rejected Value
- U = Non detected.
- mg/Kg = Milligrams per kilogram.
- NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

Bold face type indicates detected values

Red Highlighting indicates value exceeds one or more Removal Management Screening Level.

Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.

Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	S-48					
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S48-CON-01		S48-CON-02		S48-CON-R2	
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013		4/24/2013		4/24/2013
Perchlorate (mg/kg)															
Perchlorate		55	5.5		720	72		165		0.00032 J		0.00027 J		0.0055	
Total Metals (mg/kg)															
Aluminum		77000	7700		990000	99000		231000		9240		20,800 J		8,640 J	
Arsenic	0.61	34	3.4	2.4	380	38	61	102		0.98 U		1.2		1.8	
Barium		15000	1500		190000	19000		45000		44.6		31		47.7	
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U		0.5 U		0.49 U	
Cadmium	1800	70	7	9300	800	80	180000	210		0.4 J		0.22 J		0.42 J	
Calcium										55100 J		58,700		76,400	
Chromium		120000	12000		1500000	150000		360000		17		14.3		19	
Cobalt	370	23	2.3	1900	300	30	37000	69		6.4		3.6 J		6	
Copper		3100	310		41000	4100		9300		16		16.3		18.6	
Iron		55000	5500		720000	72000		165000		15600		11,000		13,000	
Lead		400	40		800	80		1200		6.9		4.5		6.5	
Magnesium										5240		4,820		6,770	
Manganese		1800	180		23000	2300		5400		319 J		218		255	
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		13.1		13.5		15.3	
Potassium										1370		937		1,690	
Selenium		390	39		5100	510		1170		3.4 U		3.5 U		3.4 U	
Sodium										250 J		217 J		310 J	
Vanadium		390	39		5100	510		1170		19.7		15		20.5	
Zinc		23000	2300		310000	31000		69000		31.5		29.3		44.9	
Mercury		10	1		43	4.3		30		0.0094 J		0.089 J		0.11	
Semivolatile Organics (mg/kg)															
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U		0.17 U		0.17 U	
2-Methylnaphthalene		230	23		2200	220		690		0.17 U		0.17 U		0.17 U	
3,3'-Dichlorobenzidine	1.1			3.8			110			0.17 U		0.17 U		0.17 U	
Anthracene		17000	1700		170000	17000		51000		0.17 U		0.17 U		0.17 U	
Benzo(a)anthracene	0.15			2.1			15			0.17 U		0.17 U		0.17 U	
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U		0.17 U		0.17 U	
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U		0.17 U		0.17 U	
Carbazole										0.17 U		0.17 U		0.17 U	
Chrysene	15			210			1500			0.17 U		0.17 U		0.17 U	
Dibenzofuran		78	7.8		1000	100		234		0.17 U		0.17 U		0.17 U	
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U		0.17 U		0.17 U	
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U		0.17 U		0.17 U	
Fluoranthene		2300	230		22000	2200		6900		0.002 J		0.17 U		0.17 U	
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U		0.17 U		0.17 U	
N-Nitrosodiphenylamine	99			350			9900			0.17 U		0.17 U		0.17 U	
PAHs (total)										0.002 J		0.004		0.17 UJ	
Phenanthrene										0.17 U		0.004 J		0.17 U	
Pyrene		1700	170		17000	1700		5100		0.17 U		0.17 U		0.17 U	

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	S-48					
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S48-CON-01		S48-CON-02		S48-CON-R2	
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013	4/24/2013	4/24/2013		
PCBs (mg/kg)															
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.033	U	0.033	U	0.063	J
PCBs (total)	0.22			0.74			22			0.033	U	0.033	U	0.063	
Pesticides (mg/kg)															
4,4'-DDE	1.4			5.1			140			0.003	UJ	0.003	UJ	0.003	J
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003	U	0.003	U	0.003	U
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003	U	0.003	U	0.003	U
Endosulfan II		370	37		3700	370		1110		0.003	UJ	0.003	UJ	0.003	UJ
Endosulfan sulfate		370	37		3700	370		1110		0.003	UJ	0.003	UJ	0.003	UJ
Endrin aldehyde	18			180			1800			0.003	UJ	0.003	UJ	0.003	UJ
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.001	UJ	0.001	UJ	0.003	J

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	T-50					
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	T50-CON-01		T50-CON-02		T50-CON-R3	
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013		4/24/2013		4/24/2013
Perchlorate (mg/kg)															
Perchlorate		55	5.5		720	72		165		0.0081		0.0087		0.003	
Total Metals (mg/kg)															
Aluminum		77000	7700		990000	99000		231000		26,600		15,600		14,700	
Arsenic	0.61	34	3.4	2.4	380	38	61	102		0.97 U		1.8		0.98 U	
Barium		15000	1500		190000	19000		45000		36.2		38.3		43.8	
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U		0.5 U		0.49 U	
Cadmium	1800	70	7	9300	800	80	180000	210		0.15 J		0.17 J		0.18 J	
Calcium										65,900		65,000		62,200	
Chromium		120000	12000		1500000	150000		360000		16.3		16.1		16	
Cobalt	370	23	2.3	1900	300	30	37000	69		4.6 J		5.7		6.1	
Copper		3100	310		41000	4100		9300		23.9		33.5		28	
Iron		55000	5500		720000	72000		165000		9,930		12,400		13,500	
Lead		400	40		800	80		1200		11.8		11.1		10.3	
Magnesium										5,030		4,610		5,230	
Manganese		1800	180		23000	2300		5400		217		222		264	
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		9.7		10.3		10.7	
Potassium										800		930		1,210	
Selenium		390	39		5100	510		1170		3.4 U		3.5 U		3.4 U	
Sodium										418 J		396 J		369 J	
Vanadium		390	39		5100	510		1170		16.1		17.3		18.5	
Zinc		23000	2300		310000	31000		69000		55.8		63.3		59.5	
Mercury		10	1		43	4.3		30		0.094 U		0.0065 J		0.096 U	
Semivolatile Organics (mg/kg)															
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		1.7 U		0.17 U		0.17 U	
2-Methylnaphthalene		230	23		2200	220		690		1.7 U		0.17 U		0.17 U	
3,3'-Dichlorobenzidine	1.1			3.8			110			0.31 J		0.17 U		0.17 U	
Anthracene		17000	1700		170000	17000		51000		1.7 U		0.17 U		0.17 U	
Benzo(a)anthracene	0.15			2.1			15			0.22 J		0.011 J		0.17 U	
Benzo(a)pyrene	0.02			0.21			1.5			1.7 UJ		0.17 UJ		0.17 UJ	
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		1.7 U		0.17 U		0.17 U	
Carbazole										1.7 U		0.17 U		0.17 U	
Chrysene	15			210			1500			0.24 J		0.015 J		0.17 U	
Dibenzofuran		78	7.8		1000	100		234		1.7 U		0.17 U		0.17 U	
Diethylphthalate		49000	4900		490000	49000		147000		1.7 U		0.17 U		0.17 U	
Di-n-octylphthalate		610	61		6200	620		1830		1.7 U		0.17 U		0.17 U	
Fluoranthene		2300	230		22000	2200		6900		0.071 J		0.005 J		0.17 U	
Naphthalene	3.6	140	14	18	620	62	360	420		1.7 U		0.17 U		0.17 U	
N-Nitrosodiphenylamine	99			350			9900			1.7 U		0.17 U		0.17 U	
PAHs (total)										0.668 J		0.031 J		0.006 J	
Phenanthrene										0.065 J		0.17 U		0.006 J	
Pyrene		1700	170		17000	1700		5100		0.072 J		0.17 U		0.17 U	

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	T-50					
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	T50-CON-01		T50-CON-02		T50-CON-R3	
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013		4/24/2013		4/24/2013
PCBs (mg/kg)															
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.15 J		0.032 UJ	0.033 UJ		
PCBs (total)	0.22			0.74			22			0.15 J		0.032 UJ	0.033 UJ		
Pesticides (mg/kg)															
4,4'-DDE	1.4			5.1			140			0.003 UJ		0.003 UJ	0.003 UJ		
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.004 NJ		0.003 U	0.003 U		
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003 U		0.003 U	0.003 U		
Endosulfan II		370	37		3700	370		1110		0.003 UJ		0.003 UJ	0.003 UJ		
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ		0.003 UJ	0.003 UJ		
Endrin aldehyde	18			180			1800			0.003 UJ		0.003 UJ	0.003 UJ		
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.006 J		0.001 UJ	0.001 UJ		

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
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- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	S-49		
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S49-CON-01	S49-CBK-01	S49-CAULK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013	4/24/2013
Perchlorate (mg/kg)												
Perchlorate		55	5.5		720	72		165		0.00068	0.00019 J	
Total Metals (mg/kg)												
Aluminum		77000	7700		990000	99000		231000		7,140	5,770	
Arsenic	0.61	34	3.4	2.4	380	38	61	102		0.99 U	9.1	
Barium		15000	1500		190000	19000		45000		32.2	75.8	
Beryllium	1400	160	16	6900	2000	200	140000	480		0.5 U	0.45 J	
Cadmium	1800	70	7	9300	800	80	180000	210		0.5 U	0.27 J	
Calcium										59,600	43,300	
Chromium		120000	12000		1500000	150000		360000		18.4	9.7	
Cobalt	370	23	2.3	1900	300	30	37000	69		4.6 J	5	
Copper		3100	310		41000	4100		9300		14.8	30.5	
Iron		55000	5500		720000	72000		165000		11,600	12,900	
Lead		400	40		800	80		1200		4	15.3	
Magnesium										4,090	2,170	
Manganese		1800	180		23000	2300		5400		196	182	
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		11.1	12.3	
Potassium										1,550	1,030	
Selenium		390	39		5100	510		1170		3.5 U	3.4 U	
Sodium										672	94.1 J	
Vanadium		390	39		5100	510		1170		16.5	13.6	
Zinc		23000	2300		310000	31000		69000		26.5	63.9	
Mercury		10	1		43	4.3		30		0.006 J	0.06 J	
Semivolatile Organics (mg/kg)												
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	4.5 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	4.5 U
3,3'-Dichlorobenzidine	1.1			3.8			110			0.17 U	0.17 U	4.5 U
Anthracene		17000	1700		170000	17000		51000		0.17 U	0.17 U	4.5 U
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.17 U	4.5 U
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U	0.17 U	4.5 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.17 U	4.5 U
Carbazole										0.17 U	0.17 U	4.5 U
Chrysene	15			210			1500			0.17 U	0.17 U	4.5 U
Dibenzofuran		78	7.8		1000	100		234		0.17 U	0.17 U	4.5 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	4.5 U
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 U	4.5 U
Fluoranthene		2300	230		22000	2200		6900		0.17 U	0.17 U	4.5 U
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	4.5 U
N-Nitrosodiphenylamine	99			350			9900			0.17 U	0.17 U	4.5 U
PAHs (total)										0.17 UJ	0.17 UJ	4.5 UJ
Phenanthrene										0.17 U	0.17 U	4.5 U
Pyrene		1700	170		17000	1700		5100		0.17 U	0.17 U	4.5 U

Table 5-2 Risk Screening of Detected Analytical Results for South Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	S-49					
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	S49-CON-01		S49-CBK-01		S49-CAULK-01	
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/24/2013		4/24/2013		4/24/2013
PCBs (mg/kg)															
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.033	U	0.11	J	0.12	J
PCBs (total)	0.22			0.74			22			0.033	U	0.11		0.12	J
Pesticides (mg/kg)															
4,4'-DDE	1.4			5.1			140			0.003	U	0.003	U		
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003	UJ	0.003	U		
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003	UJ	0.003	U		
Endosulfan II		370	37		3700	370		1110		0.003	U	0.003	U		
Endosulfan sulfate		370	37		3700	370		1110		0.003	U	0.003	U		
Endrin aldehyde	18			180			1800			0.003	U	0.003	U		
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.001	U	0.006			

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

Bold face type indicates detected values

Red Highlighting indicates value exceeds one or more Removal Management Screening Level.

Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.

Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 2		R-33	R-29
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R2-CON-01	R2-CON-02	R33-CON-01	R29-CON-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/23/2013	4/23/2013	4/22/2013
Perchlorate (mg/kg)													
Perchlorate		55	5.5		720	72		165		0.006	0.0057	0.0052	0.00051
Total Metals (mg/kg)													
Aluminum		77000	7700		990000	99000		231000		3,980	6,880	5,410	8,360
Arsenic	0.61	34	3.4	2.4	380	38	61	102		1.1	1.7	0.97 U	1.8
Barium		15000	1500		190000	19000		45000		27	36.3	22	41.4
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U	0.49 U	0.49 U	0.49 U
Cadmium	1800	70	7	9300	800	80	180000	210		0.49 J	0.22 J	0.47 J	0.15 J
Calcium										35,300	47,000	38,100	103,000
Chromium		120000	12000		1500000	150000		360000		12.3	10.5	7.1	10
Cobalt	370	23	2.3	1900	300	30	37000	69		4.9 U	4.9 U	6.9	4.9 U
Copper		3100	310		41000	4100		9300		43.4	7.5	19.4	8.1
Iron		55000	5500		720000	72000		165000		7,600	8,890	5,430	10,200
Lead		400	40		800	80		1200		28	10.7	4.8	8
Magnesium										1,600	2,250	1,710	4,080
Manganese		1800	180		23000	2300		5400		193	199	112	308
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		5.3	6	24.2	8.2
Potassium										317 J	1,920	808	3,960
Selenium		390	39		5100	510		1170		3.4 U	3.4 U	3.4 U	3.4 U
Sodium										114 J	1,240	301 J	2,220
Vanadium		390	39		5100	510		1170		6	10	5.5	10.9
Zinc		23000	2300		310000	31000		69000		87.3	45.6	74	27.7
Mercury		10	1		43	4.3		30		0.027 J	0.098 U	0.12	5.6
Semivolatile Organics (mg/kg)													
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	0.17 U	1.7 U
2,4-Dimethylphenol		1200	120		12000	1200		3600		0.17 U	0.17 U	0.17 U	1.7 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	0.17 U	1.7 U
2-Methylphenol		3100	310		31000	3100		9300		0.17 U	0.17 U	0.17 U	1.7 U
4-Methylphenol		6100	610		62000	6200		18300		0.17 U	0.17 U	0.17 U	1.7 U
Acetophenone		7800	780		100000	10000		23400		0.17 U	0.17 U	0.17 U	1.7 U
Benzo(a)anthracene	0.15			2.1			15			0.009 J	0.17 U	0.17 U	1.7 U
Benzo(a)pyrene	0.02			0.21			1.5			0.017 J	0.17 U	0.17 U	1.7 U
Benzo(b)fluoranthene	0.15			2.1			15			0.022 J	0.17 U	0.17 U	1.7 U
Benzo(g,h,i)perylene										0.025 J	0.17 U	0.17 U	1.7 U
Benzo(k)fluoranthene	1.5			21			150			0.017 J	0.17 U	0.17 U	1.7 U
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		0.89	0.17 U	0.24	1.7 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.17 U	0.17 U	1.7 U
Chrysene	15			210			1500			0.014 J	0.17 U	0.17 U	1.7 U
Dibenzo(a,h)anthracene	0.02			0.21			1.5			0.17 U	0.17 U	0.17 U	1.7 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	0.17 U	1.7 U
Dimethylphthalate										0.17 U	0.17 U	0.17 U	1.7 U
Di-n-butylphthalate		6100	610		62000	6200		18300		0.17 U	0.17 U	0.17 U	1.7 U
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 U	0.17 U	1.7 U
Fluoranthene		2300	230		22000	2200		6900		0.025 J	0.17 U	0.17 U	1.7 U
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			0.024 J	0.17 U	0.17 U	1.7 U
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	0.17 U	1.7 U
PAHs (total)										0.174	0.17 U	0.17 U	1.7 U
Phenanthrene										0.17 U	0.17 U	0.17 U	1.7 U
Phenol		18000	1800		180000	18000		54000		0.17 U	0.17 U	0.17 U	1.7 U
Pyrene		1700	170		17000	1700		5100		0.021 J	0.17 U	0.17 U	1.7 U

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 2		R-33	R-29
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R2-CON-01	R2-CON-02	R33-CON-01	R29-CON-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/23/2013	4/23/2013	4/22/2013	4/22/2013
PCBs (mg/kg)													
Aroclor-1248	0.22			0.74			22			0.033 U	0.033 U	0.032 U	0.033 U
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.033 U	0.63 J	0.057 J	0.033 U
Aroclor-1260	0.22			0.74			22			0.033 U	0.033 U	0.032 U	0.033 U
PCBs (total)	0.22			0.74			22			0.033 U	0.63	0.057	0.033 U
Pesticides (mg/kg)													
4,4'-DDD	2			7.2			200			0.003 R	0.003 R	0.003 R	0.003 R
4,4'-DDE	1.4			5.1			140			0.003 UJ	0.009 R	0.003 UJ	0.003 UJ
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003 R	0.003 R	0.003 R	0.003 R
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003 U	0.017 R	0.003 U	0.003 U
Endosulfan I		370	37		3700	370		1110		0.001 U	0.001 U	0.001 U	0.001 U
Endosulfan II		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
Endrin aldehyde	18			180			1800			0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.001 UJ	0.025 J	0.002 NJ	0.001 UJ
Methoxychlor		310	31		3100	310		930		0.017 U	0.017 U	0.017 U	0.017 U

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	R-21				
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R21-CON-01	R21-CON-02	R21-CON-03	R21-CBK-01	R21-CAULK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/22/2013	4/22/2013	4/22/2013	4/22/2013	4/22/2013
Perchlorate (mg/kg)														
Perchlorate		55	5.5		720	72		165		0.00014 U	0.0056	0.0095	0.0015	
Total Metals (mg/kg)														
Aluminum		77000	7700		990000	99000		231000		5,060	6,960	6,650	4,010	
Arsenic	0.61	34	3.4	2.4	380	38	61	102		2.5	1.8	4.1	2.9	
Barium		15000	1500		190000	19000		45000		19.6 U	21.6	36.3	43.4	
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U	0.5 U	0.49 U	0.49 U	
Cadmium	1800	70	7	9300	800	80	180000	210		0.22 J	0.23 J	15.5	0.49 U	
Calcium										82,000	75,400	128,000	46,000	
Chromium		120000	12000		1500000	150000		360000		6.2	6.4	9.2	6.3	
Cobalt	370	23	2.3	1900	300	30	37000	69		12.4	3.5 J	5.4	4.9 U	
Copper		3100	310		41000	4100		9300		51.9	11.3	249	8.1	
Iron		55000	5500		720000	72000		165000		10,700	8,730	11,500	6,360	
Lead		400	40		800	80		1200		4.2	9.9	51.5	9.4	
Magnesium										8,280	14,500	18,700	1,920	
Manganese		1800	180		23000	2300		5400		203	228 J	376	136	
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		12.4	105 J	240	7.6	
Potassium										634	833 J	1,220	813	
Selenium		390	39		5100	510		1170		3.4 U	1.3 J	3.4 U	3.4 U	
Sodium										169 J	339 J	559	351 J	
Vanadium		390	39		5100	510		1170		12.3	9.5	12.7	10.1	
Zinc		23000	2300		310000	31000		69000		35.6	37.5	1540	10.4	
Mercury		10	1		43	4.3		30		0.09 J	0.079 J	0.14	0.17	
Semivolatile Organics (mg/kg)														
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
2,4-Dimethylphenol		1200	120		12000	1200		3600		3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		3.3 U	4.2 U	3.4 U	0.045 J	0.17 U
2-Methylphenol		3100	310		31000	3100		9300		3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
4-Methylphenol		6100	610		62000	6200		18300		3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Acetophenone		7800	780		100000	10000		23400		3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Benzo(a)anthracene	0.15			2.1			15			3.3 U	0.7 J	3.4 U	0.17 U	0.17 U
Benzo(a)pyrene	0.02			0.21			1.5			3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Benzo(b)fluoranthene	0.15			2.1			15			3.3 U	0.41 J	3.4 U	0.17 U	0.17 U
Benzo(g,h,i)perylene										3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Benzo(k)fluoranthene	1.5			21			150			3.3 U	0.56 J	3.4 U	0.17 U	0.17 U
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		3.3 U	5.1	3.4 U	0.17 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		3.3 U	1.1 J	3.4 U	0.17 U	0.17 U
Chrysene	15			210			1500			3.3 U	0.67 J	3.4 U	0.17 U	0.17 U
Dibenzo(a,h)anthracene	0.02			0.21			1.5			3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		3.3 U	4.2 U	3.4 U	0.041 J	0.17 U
Dimethylphthalate										3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Di-n-butylphthalate		6100	610		62000	6200		18300		3.3 U	4.2 U	3.4 U	0.17 U	0.01 J
Di-n-octylphthalate		610	61		6200	620		1830		3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Fluoranthene		2300	230		22000	2200		6900		3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Naphthalene	3.6	140	14	18	620	62	360	420		3.3 U	4.2 U	3.4 U	0.043 J	0.17 U
PAHs (total)										0.48	2.66	3.4 U	0.055	0.17 U
Phenanthrene										0.48 J	4.2 U	3.4 U	0.012 J	0.17 U
Phenol		18000	1800		180000	18000		54000		3.3 U	4.2 U	3.4 U	0.17 U	0.17 U
Pyrene		1700	170		17000	1700		5100		3.3 U	0.32 J	3.4 U	0.17 U	0.17 U

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	R-21				
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R21-CON-01	R21-CON-02	R21-CON-03	R21-CBK-01	R21-CAULK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/22/2013	4/22/2013	4/22/2013	4/22/2013	4/22/2013
PCBs (mg/kg)														
Aroclor-1248	0.22			0.74			22			0.16 U	0.033 U	0.033 U	0.033 U	0.033 U
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		14 J	0.033 U	0.033 U	0.62 J	2.1 J
Aroclor-1260	0.22			0.74			22			0.16 U	0.033 U	0.033 U	0.033 U	0.033 U
PCBs (total)	0.22			0.74			22			14	0.033 U	0.033 U	0.62	2.1
Pesticides (mg/kg)														
4,4'-DDD	2			7.2			200			0.003 R	0.003 R	0.011 NJ	0.003 R	
4,4'-DDE	1.4			5.1			140			0.088 NJ	0.003 UJ	0.019 NJ	0.011 NJ	
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003 R	0.003 R	0.043 NJ	0.003 U	
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.12 NJ	0.003 U	0.003 R	0.014 NJ	
Endosulfan I		370	37		3700	370		1110		0.001 U	0.001 U	0.001 U	0.001 U	
Endosulfan II		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.006 J	0.003 UJ	
Endrin aldehyde	18			180			1800			0.003 UJ	0.003 UJ	0.008 J	0.003 UJ	
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.034 J	0.001 UJ	0.006 NJ	0.023 J	
Methoxychlor		310	31		3100	310		930		0.017 U	0.017 U	0.017 U	0.009 J	

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 3			R-51		
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL		Sample ID:	R3-CON-01	R3-CON-02	R3-CAULK-01	R51-CON-01	R51-CON-02
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013	
Perchlorate (mg/kg)															
Perchlorate		55	5.5		720	72		165		0.0046	0.0005		0.05	0.35	
Total Metals (mg/kg)															
Aluminum		77000	7700		990000	99000		231000		7,420	8,180		3,990 J	1,950	
Arsenic	0.61	34	3.4	2.4	380	38	61	102		1.4	1.8		3.1 J	0.39 J	
Barium		15000	1500		190000	19000		45000		50.2	32.2		80 J	22.8	
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U	0.49 U		0.53 J	0.49 U	
Cadmium	1800	70	7	9300	800	80	180000	210		0.22 J	0.49 U		1.5 J	0.49 U	
Calcium										103,000	86,700		35,700 J	23,600	
Chromium		120000	12000		1500000	150000		360000		6.9	7.2		33.5 J	4.3	
Cobalt	370	23	2.3	1900	300	30	37000	69		4.9 U	4.9 U		10.6	4.9 U	
Copper		3100	310		41000	4100		9300		5.5	10.5		69.2 J	7	
Iron		55000	5500		720000	72000		165000		6,310	7,720		14,500 J	3,810	
Lead		400	40		800	80		1200		4.1	5.1		111	2.6	
Magnesium										5,560	3,450		3,860 J	940	
Manganese		1800	180		23000	2300		5400		196	192		315 J	87.9	
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		4.4	6.9		35.9	2.8 J	
Potassium										368	1,740		938	766	
Selenium		390	39		5100	510		1170		3.4 U	3.4 U		2.4 J	0.74 J	
Sodium										1,240	441 J		905	678	
Vanadium		390	39		5100	510		1170		8.1	9.4		11.6 J	6	
Zinc		23000	2300		310000	31000		69000		28.4	45.8		628	19.4	
Mercury		10	1		43	4.3		30		0.011 J	0.14		0.026 J	0.096 U	
Semivolatile Organics (mg/kg)															
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
2,4-Dimethylphenol		1200	120		12000	1200		3600		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	5 U	0.015 J	0.17 U	
2-Methylphenol		3100	310		31000	3100		9300		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
4-Methylphenol		6100	610		62000	6200		18300		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Acetophenone		7800	780		100000	10000		23400		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Benzo(b)fluoranthene	0.15			2.1			15			0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Benzo(g,h,i)perylene										0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Benzo(k)fluoranthene	1.5			21			150			0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		0.17 U	0.17 U	5 U	1.1	0.17 U	
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Chrysene	15			210			1500			0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Dibenzo(a,h)anthracene	0.02			0.21			1.5			0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	5 U	0.17 U	0.0077 J	
Dimethylphthalate										0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Di-n-butylphthalate		6100	610		62000	6200		18300		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Fluoranthene		2300	230		22000	2200		6900		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
PAHs (total)										0.17 U	0.17 U	5 U	0.16	0.17 U	
Phenanthrene										0.17 U	0.17 U	5 U	0.16 J	0.17 U	
Phenol		18000	1800		180000	18000		54000		0.17 U	0.17 U	5 U	0.17 U	0.17 U	
Pyrene		1700	170		17000	1700		5100		0.17 U	0.17 U	5 U	0.17 U	0.17 U	

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 3			R-51	
	CarcSL	NoncarcSL	NoncarcSL	CarcSL	NoncarcSL	NoncarcSL	CarcSL	NoncarcSL	Sample ID:	R3-CON-01	R3-CON-02	R3-CAULK-01	R51-CON-01	R51-CON-02
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013
PCBs (mg/kg)														
Aroclor-1248	0.22			0.74			22			0.033 U	0.033 U	0.032 U	0.033 U	0.033 U
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.033 U	0.033 U	0.032 U	0.093	0.026 J
Aroclor-1260	0.22			0.74			22			0.033 U	0.033 U	0.032 U	0.033 U	0.033 U
PCBs (total)	0.22			0.74			22			0.033 U	0.033 U	0.032 U	0.093	0.026
Pesticides (mg/kg)														
4,4'-DDD	2			7.2			200			0.003 R	0.003 R		0.0033 R	0.0033 R
4,4'-DDE	1.4			5.1			140			0.003 UJ	0.003 UJ		0.0033 UJ	0.0033 UJ
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003 U	0.003 U		0.0033 UJ	0.0033 UJ
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003 U	0.003 U		0.026 NJ	0.0033 UJ
Endosulfan I		370	37		3700	370		1110		0.001 U	0.001 U		0.024 J	0.0017 UJ
Endosulfan II		370	37		3700	370		1110		0.003 UJ	0.003 UJ		0.017 NJ	0.0033 UJ
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ	0.003 UJ		0.023 J	0.0033 UJ
Endrin aldehyde	18			180			1800			0.003 UJ	0.003 UJ		0.023 J	0.0033 UJ
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.001 UJ	0.001 UJ		0.015 J	0.0012 J
Methoxychlor		310	31		3100	310		930		0.017 U	0.017 U		0.017 UJ	0.017 UJ

Key:

- J = Estimated value.
- R - Rejected Value
- U = Non detected.
- mg/Kg = Milligrams per kilogram.
- NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location: Sample ID: Date:	Test Stand 4				
	CarcSL TR=1E-6	Noncarc SL THI=1.0	Noncarc SL THI=0.1	CarcSL TR=1E-6	Noncarc SL THI=1.0	Noncarc SL THI=0.1	CarcSL TR=1E-4	Noncarc SL THI=3.0		R4-CON-01	R4-CON-02	R4-CON-03	R4-CON-04	R4-CON-05
										4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013
Perchlorate (mg/kg)														
Perchlorate		55	5.5		720	72		165		8.4	0.068	0.0056	0.0075	0.0088
Total Metals (mg/kg)														
Aluminum		77000	7700		990000	99000		231000		9,260	6,850	10,400	8,790	5,970
Arsenic	0.61	34	3.4	2.4	380	38	61	102		2.2	2.5	1.5	1.6	1.7
Barium		15000	1500		190000	19000		45000		29.8	41.2	42.4	39.1	38.7
Beryllium	1400	160	16	6900	2000	200	140000	480		0.5 U	0.49 U	0.16 J	0.49 U	0.49 U
Cadmium	1800	70	7	9300	800	80	180000	210		2.9	0.61	0.24 J	1.5	3.4
Calcium										48,300	90,500	80,000	48,700	66,300
Chromium		120000	12000		1500000	150000		360000		37.9	15.8	11	19.9	15.1
Cobalt	370	23	2.3	1900	300	30	37000	69		5 U	4.9 U	4.9 U	4.9 U	4.9 U
Copper		3100	310		41000	4100		9300		23.4	8.8	8.7	11.7	11.1
Iron		55000	5500		720000	72000		165000		15,800	9,940	8,700	8,500	10,600
Lead		400	40		800	80		1200		406	8.2	4.9	16.7	9.5
Magnesium										2,240	2,970	2,870	2,370	2,540
Manganese		1800	180		23000	2300		5400		203	237	200	179	179
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		17	7.6	8.6	10.7	11.3
Potassium										838	1,160	796	1,540	664
Selenium		390	39		5100	510		1170		3.5 U	3.4 U	3.4 U	3.4 U	3.4 U
Sodium										687	881	437 J	863	345 J
Vanadium		390	39		5100	510		1170		9.9	11.8	11.7	9.8	10.1
Zinc		23000	2300		310000	31000		69000		94	41.5	34.9	93.6	247
Mercury		10	1		43	4.3		30		0.1	0.025 J	1.2	4.1	0.42
Semivolatile Organics (mg/kg)														
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
2,4-Dimethylphenol		1200	120		12000	1200		3600		0.17 U	0.17 U	1.7 U	4.4	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
2-Methylphenol		3100	310		31000	3100		9300		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
4-Methylphenol		6100	610		62000	6200		18300		0.17 U	0.17 U	1.7 U	5.9	0.12 J
Acetophenone		7800	780		100000	10000		23400		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.17 U	1.7 U	3.4 U	0.01 J
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U	0.17 U	1.7 U	3.4 U	0.018 J
Benzo(b)fluoranthene	0.15			2.1			15			0.17 U	0.17 U	1.7 U	3.4 U	0.021 J
Benzo(g,h,i)perylene										0.17 U	0.17 U	1.7 U	3.4 U	0.027 J
Benzo(k)fluoranthene	1.5			21			150			0.17 U	0.17 U	1.7 U	3.4 U	0.021 J
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Chrysene	15			210			1500			0.17 U	0.17 U	1.7 U	3.4 U	0.009 J
Dibenzo(a,h)anthracene	0.02			0.21			1.5			0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Dimethylphthalate										0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Di-n-butylphthalate		6100	610		62000	6200		18300		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 U	1.7 U	3.4 U	0.011 J
Fluoranthene		2300	230		22000	2200		6900		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			0.008 J	0.17 U	1.7 U	3.4 U	0.032 J
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
PAHs (total)										0.008	0.17 U	1.7 U	3.4 U	0.138
Phenanthrene										0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Phenol		18000	1800		180000	18000		54000		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U
Pyrene		1700	170		17000	1700		5100		0.17 U	0.17 U	1.7 U	3.4 U	0.17 U

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 4					
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R4-CON-01	R4-CON-02	R4-CON-03	R4-CON-04	R4-CON-05	
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0		Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013
PCBs (mg/kg)															
Aroclor-1248	0.22			0.74			22			0.033 U	0.033 U	0.033 U	0.033 U	0.032 U	
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.035 J	0.033 U	0.027 J	0.5 J	0.063 J	
Aroclor-1260	0.22			0.74			22			0.033 U	0.033 U	0.033 U	0.033 U	0.032 U	
PCBs (total)	0.22			0.74			22			0.035	0.033 U	0.027	0.5	0.063	
Pesticides (mg/kg)															
4,4'-DDD	2			7.2			200			0.003 R	0.003 R	0.003 R	0.003 R	0.003 R	
4,4'-DDE	1.4			5.1			140			0.004 J	0.003 UJ	0.003 UJ	0.015 NJ	0.003 UJ	
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.005 R	0.003 U	0.003 U	0.026 NJ	0.003 U	
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.003 U	0.003 U	0.003 U	0.009 R	0.003 U	
Endosulfan I		370	37		3700	370		1110		0.001 U	0.001 U	0.001 U	0.012 J	0.001 U	
Endosulfan II		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	
Endrin aldehyde	18			180			1800			0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	0.003 UJ	
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.002 NJ	0.001 UJ	0.001 J	0.017 J	0.002 J	
Methoxychlor		310	31		3100	310		930		0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

Bold face type indicates detected values

Red Highlighting indicates value exceeds one or more Removal Management Screening Level.

Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.

Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 4			Scrubber	
	CarcSL	NoncarcSL	NoncarcSL	CarcSL	NoncarcSL	NoncarcSL	CarcSL	NoncarcSL	Sample ID:	R4-CON-06	R4-CON-07	R4-CBK-01	SCRUBBER-CON-01	SCRUBBER-CON-02
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013
Perchlorate (mg/kg)														
Perchlorate		55	5.5		720	72		165		0.0049	0.022	0.0011	0.089	0.0031
Total Metals (mg/kg)														
Aluminum		77000	7700		990000	99000		231000		7,330	8,670	3,620	12,700	9,990
Arsenic	0.61	34	3.4	2.4	380	38	61	102		4.9	5.4	3.6	1.2	2.9
Barium		15000	1500		190000	19000		45000		58.9	62.8	25.9	39.4	62.4
Beryllium	1400	160	16	6900	2000	200	140000	480		0.49 U	0.5 U	0.49 U	0.16 J	0.24 J
Cadmium	1800	70	7	9300	800	80	180000	210		5	3.2	0.49 U	0.23 J	0.34 J
Calcium										86,100	144,000	33,200	55,800	87,900
Chromium		120000	12000		1500000	150000		360000		30.8	31.6	5.5	13.5	23.9
Cobalt	370	23	2.3	1900	300	30	37000	69		5.5	5.1	4.9 U	2.8 J	4.7 J
Copper		3100	310		41000	4100		9300		28.4	19	6.3	11.1	20.1
Iron		55000	5500		720000	72000		165000		14,300	17,600	6,960	10,400	13,600
Lead		400	40		800	80		1200		32.4	19	7.1	21.3	53.2
Magnesium										3,320	4,910	2,260	3,940	4,510
Manganese		1800	180		23000	2300		5400		233	285	190	177	250
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		14.6	15.6	4.9	7.1	11.7
Potassium										1,060	888	589	548	1,030
Selenium		390	39		5100	510		1170		3.4 U	3.5 U	3.4 U	3.5 U	3.4 U
Sodium										481 J	520	182 J	394 J	400 J
Vanadium		390	39		5100	510		1170		13.9	16.1	6.8	11.7	15.1
Zinc		23000	2300		310000	31000		69000		252	230	28.4	117	194
Mercury		10	1		43	4.3		30		0.71	0.12	0.14	0.015 J	0.053 J
Semivolatile Organics (mg/kg)														
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	0.17 U	0.17 U	0.016 J
2,4-Dimethylphenol		1200	120		12000	1200		3600		0.58	0.17 U	0.17 U	0.17 U	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	0.17 U	0.17 U	0.02 J
2-Methylphenol		3100	310		31000	3100		9300		0.061 J	0.17 U	0.17 U	0.17 U	0.17 U
4-Methylphenol		6100	610		62000	6200		18300		1.7	0.17 U	0.17 U	0.17 U	0.17 U
Acetophenone		7800	780		100000	10000		23400		0.17 U	0.17 U	0.18	0.17 U	1.2
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Benzo(a)pyrene	0.02			0.21			1.5			0.014 J	0.016 J	0.17 U	0.17 U	0.17 U
Benzo(b)fluoranthene	0.15			2.1			15			0.17 U	0.016 J	0.009 J	0.17 U	0.17 U
Benzo(g,h,i)perylene										0.017 J	0.021 J	0.17 U	0.17 U	0.17 U
Benzo(k)fluoranthene	1.5			21			150			0.17 U	0.009 J	0.01 J	0.17 U	0.17 U
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		0.17 U	0.17 U	0.29	0.17 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.009 J	0.17 U	0.17 U	0.17 U	0.17 U
Chrysene	15			210			1500			0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Dibenzo(a,h)anthracene	0.02			0.21			1.5			0.02 J	0.017 J	0.17 U	0.17 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Dimethylphthalate										0.17 U	0.17 U	0.17 U	0.17 U	0.064 J
Di-n-butylphthalate		6100	610		62000	6200		18300		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Di-n-octylphthalate		610	61		6200	620		1830		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Fluoranthene		2300	230		22000	2200		6900		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			0.016 J	0.019 J	0.17 U	0.17 U	0.17 U
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	0.17 U	0.17 U	0.011 J
PAHs (total)										0.067	0.098	0.019	0.17 U	0.028
Phenanthrene										0.17 U	0.17 U	0.17 U	0.17 U	0.017 J
Phenol		18000	1800		180000	18000		54000		2.9	0.17 U	0.17 U	0.17 U	0.17 U
Pyrene		1700	170		17000	1700		5100		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Test Stand 4			Scrubber	
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	R4-CON-06	R4-CON-07	R4-CBK-01	SCRUBBER-CON-01	SCRUBBER-CON-02
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013
PCBs (mg/kg)														
Aroclor-1248	0.22			0.74			22			0.033 U	0.033 U	0.032 U	0.033 U	0.032 U
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.033 U	0.033 U	0.032 U	0.033 U	0.032 U
Aroclor-1260	0.22			0.74			22			1.1 J	0.033 U	0.032 U	0.033 U	0.17
PCBs (total)	0.22			0.74			22			1.1	0.033 U	0.032 U	0.033 U	0.17
Pesticides (mg/kg)														
4,4'-DDD	2			7.2			200			0.003 R	0.003 R	0.003 R	0.0033 R	0.0032 R
4,4'-DDE	1.4			5.1			140			0.003 R	0.003 UJ	0.003 UJ	0.0033 U	0.0032 U
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.003 U	0.003 U	0.003 U	0.0033 U	0.0032 U
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.02	0.003 U	0.003 U	0.0033 U	0.0022 J
Endosulfan I		370	37		3700	370		1110		0.001 U	0.001 U	0.001 U	0.0017 U	0.0017 U
Endosulfan II		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.0033 U	0.0032 U
Endosulfan sulfate		370	37		3700	370		1110		0.003 UJ	0.003 UJ	0.003 UJ	0.0033 U	0.013 NJ
Endrin aldehyde	18			180			1800			0.029 R	0.003 UJ	0.003 UJ	0.0033 U	0.0043 R
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.019 J	0.001 UJ	0.001 UJ	0.0017 U	0.0038
Methoxychlor		310	31		3100	310		930		0.017 U	0.017 U	0.017 U	0.017 U	0.017 U

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Water Cooling Tower	Condenser and Hot Well		Agitator and Effluent Treatment Basin	
	CarcSL	NoncarcSL	NoncarcSL	CarcSL	NoncarcSL	NoncarcSL	CarcSL	NoncarcSL	Sample ID:	WCT-CON-01	COND/HW-CON-01	COND/HW-CON-02	AGITATOR-CON-01	AGITATOR-CBK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013
Perchlorate (mg/kg)														
Perchlorate		55	5.5		720	72		165		0.00029 J	0.00039 J	0.0002 U	0.0081	0.001
Total Metals (mg/kg)														
Aluminum		77000	7700		990000	99000		231000		8,790	19,000	5,410	26,500	4,920
Arsenic	0.61	34	3.4	2.4	380	38	61	102		1.4	1.5	2.4	1.7	1.7
Barium		15000	1500		190000	19000		45000		33.8	31.6	27.7	31.7	27.7
Beryllium	1400	160	16	6900	2000	200	140000	480		0.16 J	0.49 U	0.49 U	0.22 J	0.5 U
Cadmium	1800	70	7	9300	800	80	180000	210		0.57	0.31 J	0.19 J	0.28 J	0.5 U
Calcium										75,900	45,800	94,900	31,000	44,000
Chromium		120000	12000		1500000	150000		360000		8.8	9.5	11.8	10.3	5.6
Cobalt	370	23	2.3	1900	300	30	37000	69		5 U	4.9 U	4.9 U	4.9 U	5 U
Copper		3100	310		41000	4100		9300		8.1	8.6	10	10.7	6.7
Iron		55000	5500		720000	72000		165000		8,210	9,410	9,140	10,500	6,790
Lead		400	40		800	80		1200		10.6	10.8	6	5.6	4.8
Magnesium										3,260	2,530	2,670	3,790	2,290
Manganese		1800	180		23000	2300		5400		228	241	140	375	139
Nickel	13000	1500	150	64000	20000	2000	1300000	4500		5.7	6.5	5.7	10.4	8.2
Potassium										389 J	557	259 J	365 J	1,190
Selenium		390	39		5100	510		1170		1.5 J	1.4 J	1.5 J	1.5 J	1.1 J
Sodium										69 J	186 J	264 J	77 J	277 J
Vanadium		390	39		5100	510		1170		11.6	11.4	25	13.1	8.4
Zinc		23000	2300		310000	31000		69000		216	170	22.4	69.7	21.3
Mercury		10	1		43	4.3		30		0.098 U	0.1 U	0.096 U	0.018 J	0.094 U
Semivolatile Organics (mg/kg)														
1,1'-Biphenyl	80	51	5.1	360	210	21	8000	153		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2,4-Dimethylphenol		1200	120		12000	1200		3600		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2-Methylnaphthalene		230	23		2200	220		690		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
2-Methylphenol		3100	310		31000	3100		9300		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
4-Methylphenol		6100	610		62000	6200		18300		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Acetophenone		7800	780		100000	10000		23400		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Benzo(a)anthracene	0.15			2.1			15			0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Benzo(a)pyrene	0.02			0.21			1.5			0.17 U	0.17 U	0.17 U	0.025 J	0.17 U
Benzo(b)fluoranthene	0.15			2.1			15			0.17 U	0.17 U	0.17 U	0.17 UJ	0.17 U
Benzo(g,h,i)perylene										0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Benzo(k)fluoranthene	1.5			21			150			0.17 U	0.17 U	0.17 U	0.17 UJ	0.17 U
Bis(2-ethylhexyl)phthalate	35	1200	120	120	12000	1200	3500	3600		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Butylbenzylphthalate	260	12000	1200	910	120000	12000	26000	36000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Chrysene	15			210			1500			0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Dibenzo(a,h)anthracene	0.02			0.21			1.5			0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Diethylphthalate		49000	4900		490000	49000		147000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Dimethylphthalate										0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Di-n-butylphthalate		6100	610		62000	6200		18300		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Di-n-octylphthalate		610	61		6200	620		1830		0.0055 J	0.17 U	0.17 U	0.021 J	0.17 U
Fluoranthene		2300	230		22000	2200		6900		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Indeno(1,2,3-cd)pyrene	0.15			2.1			15			0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Naphthalene	3.6	140	14	18	620	62	360	420		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
PAHs (total)										0.17 U	0.17 U	0.17 U	0.025 J	0.17 U
Phenanthrene										0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Phenol		18000	1800		180000	18000		54000		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Pyrene		1700	170		17000	1700		5100		0.17 U	0.17 U	0.17 U	0.17 U	0.17 U

Table 5-3 Risk Screening of Detected Analytical Results for East Stand Area Building Materials, Remedial Investigation for the Radiation Technology Superfund Site, Operable Unit 3, Rockaway Township, Morris County, New Jersey

Analyte	Residential			Industrial			Removal		Location:	Water Cooling Tower	Condenser and Hot Well		Agitator and Effluent Treatment Basin	
	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Noncarc SL	CarcSL	Noncarc SL	Sample ID:	WCT-CON-01	COND/HW-CON-01	COND/HW-CON-02	AGITATOR-CON-01	AGITATOR-CBK-01
	TR=1E-6	THI=1.0	THI=0.1	TR=1E-6	THI=1.0	THI=0.1	TR=1E-4	THI=3.0	Date:	4/23/2013	4/23/2013	4/23/2013	4/23/2013	4/23/2013
PCBs (mg/kg)														
Aroclor-1248	0.22			0.74			22			0.032 U	0.032 U	0.21 J	0.033 U	0.059 J
Aroclor-1254	0.22	1.1	0.11	0.74	11	1.1	22	3.3		0.032 U	0.032 U	0.033 U	0.033 U	0.033 U
Aroclor-1260	0.22			0.74			22			0.032 U	0.032 U	0.033 U	0.033 U	0.033 U
PCBs (total)	0.22			0.74			22			0.032 U	0.032 U	0.21	0.033 U	0.059
Pesticides (mg/kg)														
4,4'-DDD	2			7.2			200			0.0032 R	0.0032 R	0.0033 R	0.0033 R	0.0033 R
4,4'-DDE	1.4			5.1			140			0.0032 U	0.0032 U	0.0033 UJ	0.0033 UJ	0.0033 UJ
4,4'-DDT	1.7	36	3.6	7	430	43	170	108		0.0032 U	0.0032 U	0.0033 UJ	0.0033 UJ	0.0033 UJ
Dieldrin	0.03	3.1	0.31	0.11	31	3.1	3	9.3		0.0032 U	0.0032 U	0.0033 UJ	0.0033 UJ	0.0033 UJ
Endosulfan I		370	37		3700	370		1110		0.0017 U	0.0017 U	0.0017 UJ	0.0017 UJ	0.0017 UJ
Endosulfan II		370	37		3700	370		1110		0.0032 U	0.0032 U	0.0033 UJ	0.0033 UJ	0.0033 UJ
Endosulfan sulfate		370	37		3700	370		1110		0.0032 U	0.0032 U	0.0033 UJ	0.0033 UJ	0.0033 UJ
Endrin aldehyde	18			180			1800			0.0032 U	0.0032 U	0.0033 UJ	0.0033 UJ	0.0033 UJ
gamma-Chlordane	1.6	35	3.5	6.5	400	40	160	105		0.0017 U	0.0017 U	0.0029 NJ	0.0017 UJ	0.0017 UJ
Methoxychlor		310	31		3100	310		930		0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ

Key:

J = Estimated value.

R - Rejected Value

U = Non detected.

mg/Kg = Milligrams per kilogram.

NJ = Analyte is "tentatively identified" value is an approximate concentration.

Formatting Key:

- Bold face type indicates detected values
- Red Highlighting indicates value exceeds one or more Removal Management Screening Level.
- Orange Highlighting indicates value exceeds one more more Industrial Use Screening Level.
- Yellow highlighting indicates value exceeded one or more Residential Use Screening Level.

Test Stand 3

Residential SLs were exceeded for aluminum, arsenic, iron, and manganese in concrete samples.

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The Industrial SLs for arsenic and lead in a concrete sample and the Residential SLs for cobalt and manganese were exceeded in the same concrete sample.

Test Stand 4

The Industrial SLs for arsenic and the Residential SLs for perchlorate, aluminum, arsenic, cobalt, iron, and manganese were exceeded in concrete and cinder block samples.

Scrubber

The Industrial SL for arsenic, lead and Aroclor 1260, and the Residential SLs for aluminum, arsenic, cobalt, iron, lead, and manganese were exceeded in concrete samples.

Water Cooling Tower

Residential SLs for aluminum, arsenic, iron, and manganese were exceeded in the concrete sample.

Condenser and Hot Well

Residential SLs for aluminum, arsenic, iron, and manganese were exceeded in the concrete samples.

Agitator and Effluent Treatment Basin

Residential SLs for aluminum, arsenic, iron, manganese, and benzo(a)pyrene were exceeded in the concrete and cinder block samples.

5.3 Hazardous Substances SLRA Discussion**5.3.1 Screening Levels**

The screening levels used in this assessment are threshold values. Concentrations below these values are generally not of concern from a regulatory perspective. As concentrations increase above these values they may begin to become a regulatory concern.

In the EPA's risk assessment process, screening levels are generally used to identify chemicals of potential concern (COPCs). Chemicals found at concentrations above the screening levels are COPCs and would be carried forward through the risk assessment process. Those with maximum concentrations below the screening levels are set aside and not considered further in the risk assessment process. The EPA uses a cancer risk threshold of 1E-6 and a hazard index threshold of 1 or 0.1 for assessing long-term chronic risks. Adverse non-cancer effects are not expected if the hazard index is less than 1, but a screening level of 0.1 is used to allow for potential additive effects if multiple

chemicals are present that may affect the same target tissue or organ. A cancer risk threshold of 1E-4 and a non-cancer hazard index threshold of 3 are used for evaluating whether a removal action may be needed.

5.3.2 Risk and Hazard Estimates

Potential risks and hazards to receptor populations were not calculated as part of this screening risk assessment because the available data was not suitable for that purpose for the reasons discussed in the background section. Generic estimates of the potential risks and hazards associated with the contaminant concentrations found in the samples can be calculated using risk-based screening levels as follows:

$$CR_i = TCR \times C_{soil} / RBSL_{c-soil} \quad \text{Equation 1}$$

$$HQ_i = THQ \times C_{soil} / RBSL_{nc-soil} \quad \text{Equation 2}$$

Where:

- CR_i = Cancer Risk for an individual chemical
- TCR = Target Cancer Risk (e.g. 1E-6)
- HQ_i = Non-cancer Hazard Quotient for an individual chemical
- THQ = Target Hazard Quotient (e.g. 0.1 or 1.0)
- $RBSL_{c-soil}$ = Risk-Based Screening Level for carcinogenic effects for soil
- $RBSL_{nc-soil}$ = Risk-Based Screening Level for noncarcinogenic effects for soil
- C_{soil} = Chemical concentration in soil.

The total cancer risk for a sample is then the sum of the estimated cancer risks from the individual COPCs. Similarly, the total hazard index for a sample is the sum of the hazard quotients for individual COPCs. Hazard indices are segregated by target organ.

5.3.3 Uncertainties

There are a number of sources of uncertainty in this screening level risk assessment. Several chemicals that were measured analytically lack screening levels because they lack quantitative toxicity values. Calcium, magnesium, potassium, and sodium lack toxicity values because they are found throughout the body and are considered essential nutrients. Other chemicals exist in several forms that can be measured analytically but for which separate toxicity values have not been established. In these cases screening levels for the parent compound or a very closely related compound were used as surrogates. The surrogates used are listed in Table 5-4.

As mentioned previously, a number of chemicals were not detected at detection limit concentrations higher than their risk based screening levels (RBSLs). It is possible that some of these chemicals could be present at some concentration between zero and their detection limits. If present at undetected concentrations greater than their RBSLs they could present an undetected risk or hazard.

Table 5-4 Screening Level Surrogate Compounds

Measured Chemical	Surrogate Used
Total Chromium	Chromium III
delta-BHC	Hexachlorocyclohexane (BHC), Technical
Endosulfan I	Endosulfan
Endosulfan II	Endosulfan
Endosulfan Sulfate	Endosulfan
Endrin Aldehyde	Endrin
gamma-Chlordane	Chlordane

Since contact with potentially contaminated surfaces of various structures and materials is the primary exposure pathway of concern at the site, the lack of EPA risk assessment guidance or algorithms for assessing contaminant intake and human health risk from contact with building surfaces should be considered another source of uncertainty.

5.4 ACM and LBP Survey Results

The YU report that details the results of these surveys is in Appendix B. The results of the surveys can be summarized as follows:

Asbestos

A total of 98 bulk samples of suspect ACM were collected and submitted for analysis. Different types of ACM (thermal system insulation and/or miscellaneous) were identified in 15 buildings/structures out of total of 35 at the RTI site: East Stand Area (seven buildings); South Stand Area (four buildings) and P2 Area (four buildings). A total of 46 ACMs were identified through a synthesized assessment. A total of 44 ACMs were confirmed through laboratory results to contain concentrations of asbestos ranging from 2 to 32%. Two materials were assumed ACM due to inaccessibility. These materials include both friable asbestos materials (that can be crumbled, pulverized, or reduced to powder under the hand pressure) and non-friable organically bound asbestos materials. The condition of all of the ACMs was identified as poor.

Lead-Based Paint

A total of 424 XRF readings were taken within the 21 identified structures with suspect painted components. A total of 36 paint chips of different colors and from different building components and locations throughout East Stand, South Stand and P2 Areas (where painted surfaces were identified) were collected and sent to EMSL Analytical, Inc., for analysis. LBP was identified by XRF screening as present in poor condition within all three project areas on concrete walls, window sills, metal columns, and metals doors. Out of 36 paint chip samples tested, 19 samples had lead concentrations greater than 0.5% by dry weight or 1 mg/cm² – and are considered to contain LBP. The condition of all of the LBPs was identified as poor.

5.4.1 Potential Exposure Scenarios

Since the site is presently unused, the only human exposures likely to occur under existing conditions are occasional brief exposures of site trespassers. Since the ACMs are in poor condition, exposure to asbestos could result from direct contact with these material followed by hand-to-mouth contact resulting in incidental ingestion. If friable materials are disturbed, asbestos fibers also could be released to the air where they could be inhaled. The LBP is also in poor condition. Potential lead exposure could most likely result from incidental ingestion of lead containing dust and paint chips. Inhalation of airborne dust is also possible, but is less likely than incidental ingestion and would probably result in much smaller exposures.

5.4.2 Potential Health Effects from ACM or LPB exposure**Asbestos**

Asbestos fibers can enter the body through inhalation, ingestion, and absorption. Health effects involving exposure to asbestos fibers include lung cancer, mesothelioma (cancer of pleural or peritoneal cavity linings), gastrointestinal cancers, asbestosis (scarring of the lungs), and other forms of lung diseases.

Lead-Based Paint

Exposure to excessive levels of lead can cause brain damage; affect a child's growth; damage kidneys; impair hearing; cause vomiting, headaches, and appetite loss; and cause learning and behavioral problems. In adults, lead can increase blood pressure and can cause digestive problems, kidney damage, nerve disorders, sleep problems, muscle and joint pain, and mood changes.

5.4.3 Discussion

Since the site is presently unused, the only human exposures likely to occur under existing conditions are occasional brief exposures of site trespassers. Potential ACM and LBP exposures are not expected to be great enough to pose significant health risks. The site is not located immediately adjacent to residential areas, so potential trespassers are not expected to include young children who are particularly sensitive to lead exposure. If the buildings or structures containing asbestos and/or LBP are to be reused or demolished in the future, the asbestos and lead contamination found by these surveys will need to be addressed in accordance with applicable regulations.

6

Site Summary

6.1 Summary of Site Investigation

The RI conducted at the RTI Superfund Site OU3 area involved development of a QAPP, FSP, CQCP, and HASP. In addition, a cultural significance study and an asbestos and hazardous materials survey were also completed. RI fieldwork activities were conducted on April 22 through 26, 2013, and consisted of concrete, cinder block, caulk, soil, water, and tank contents/oil sampling; and ACM and LBP sampling.

E & E developed the QAPP, FSP, CQCP, and HASP; and performed the historical records search; field investigation; and data assessments. Analytical services were provided by Test America Denver in Arvada, Colorado and the EPA CLP program. Data validation was conducted by E & E for the Test America results. The CLP laboratory data was validated by the EPA data validation contractor. A cultural significance study was completed by Hartgen located in Rensselaer, New York. An ACM and LBP survey was completed by YU located in Elmwood Park, New Jersey.

As described in the QCSR (see Appendix C), the usability of the data for pesticides DDT compounds, dieldrin, and gamma-chlordane are limited because the results could not be confirmed or were rejected. The qualifications suggest that many of the reported pesticide values were due to the presence of the interferences and not actual presence of the pesticide. Since the samples were primarily building materials, this is not unexpected. The data cannot be used to determine low concentrations of pesticides in samples. Since the screening criteria levels are well above the quantitation limit for most pesticides there is no impact on the usability of the data to compare to screening criteria for disposal or risk assessment purposes.

6.2 Nature and Extent of Contamination

A summary of the analytical results that exceeded their respective screening standards are described below and are also summarized on Table 6-1.

6.2.1 P2 Area

In the P2 Area, a total of seven concrete, three cinder block, one caulk, and one oil sample were collected from a total of four buildings/structures: R-47; Paint Locker; Acid (Oxidizer) Storage Tank; and R-34. The following summarizes the analytical results that exceeded their respective screening standards:

6.2.1.1 R-47**Concrete Samples**

- Total PCBs were detected in R47-CON-01 at 680 mg/kg and duplicate sample R47-CON-R7 at 302 mg/kg. Both of these concentrations exceeded both the RDCSRS and Non-RDCSRS screening standards.
- Analyte 4,4-DDE was detected at a concentration of 3.8 J mg/kg in R47-CON-01. This sample exceeded the RDCSRS screening standard. Dieldrin was detected at a concentration of 4.4 J mg/kg in R47-CON-01. This sample exceeded the RDCSRS and Non-RDCSRS screening standards. Dieldrin was also detected at a concentration of 0.11 J mg/kg in R47-CON-02, which exceeded the RDCSRS screening standard. Gamma-BHC (Lindane) was detected at a concentration of 0.79 mg/kg in duplicate sample R47-CON-R7. This sample exceeded the RDCSRS screening standard. Gamma-chlordane was detected at a concentration of 3.7 NJ mg/kg in R47-CON-01. This sample exceeded the RDCSRS and Non-RDCSRS screening standards.

Cinder Block Samples

- Arsenic and magnesium had concentration of 96.4 mg/kg and 1,410 mg/kg, respectively. These concentrations exceed both the RDCSRS and Non-RDCSRS screening standards. Manganese was also detected at a concentration of 12,800 mg/kg which exceeds the Non-RDCSRS screening standard.
- Total PCBs were detected at a concentration of 1.8 mg/kg, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

6.2.1.2 Paint Locker**Cinder Block Sample**

- Benzo(a)anthracene was detected at a concentration of 0.79 mg/kg, which exceeds the RDCSRS screening standard. Benzo(a)pyrene was also detected at a concentration of 0.3 J, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

Caulk Sample

- Total PCBs were detected at a concentration of 2 mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standard.

6.2.1.3 Acid (Oxidizer) Storage Tank

None of the sample results contained concentrations that exceeded their respective screening standards.

6.2.1.4 R-34**Concrete Samples**

- Antimony was detected in duplicate sample R34-CON-R6 at a concentration of 57.5 J mg/kg, which exceeds the RDCSRS screening standard.
- Total PCBs were detected in R34-CON-01 at a concentration of 0.2 mg/kg, which exceeds the RDCSRS screening standard.

Oil Sample (Wall Mounted Transformer)

- Total PCBs were detected in the oil sample at 55 J mg/kg, which exceeds both the RDCSRS and Non-RDCSRS screening standards. The oil sample also contained concentrations of motor oils and petroleum hydrocarbons C10-C28, which do not have screening standards.

Cinder Block Sample

- Total PCBs were detected at a concentration of 0.23 mg/kg, which exceeds the RDCSRS screening standard.

6.2.2 South Stand Area

In the South Stand Area, a total of 13 concrete, four cinder block, three caulk, and one water sample were collected from a total of eight buildings/structures (Test Stand 12 [S-12]; S-46; Test Stand 11 [S-11]; Test Stand 37 [S-37]; No. 1 Sewage Treatment Plant; S-48; T-50; and S-49). The following summarizes the analytical results that exceeded their respective screening standards:

6.2.2.1 Test Stand 12 (S-12)**Concrete Sample**

- Total PCBs were detected at a concentration of 1.3 mg/kg in S12-CON-02, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

Caulk Sample

- Total PCBs were detected at a concentration of 49 mg/kg, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

6.2.2.2 S-46**Concrete Sample**

- Total PCBs were detected at the same concentration of 65 J mg/kg in both concrete samples, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

- Dieldrin was detected at a concentration of 2.7 NJ mg/kg and 2 NJ mg/kg in samples S46-CON-01 and S46-CON-02, respectively. These concentrations exceeded both the RDCSRS and Non-RDCSRS screening standards. Gamma-chlordane was also detected in sample S46-CON-01 at a concentration of 3.6 mg/kg which exceeded both screening standards.

Cinder Block Sample

- Total PCBs were detected at a concentration of 0.64 mg/kg, which exceeds the RDCSRS screening standard.

Caulk Sample

- Total PCBs were detected at a concentration of 0.5 mg/kg, which exceeds the RDCSRS screening standard.

6.2.2.3 Test Stand 11 (S-11)

None of the sample results contained concentrations that exceeded their respective screening standards.

6.2.2.4 Test Stand 37 (S-37)

The samples did not contain concentrations that exceeded their respective screening standards.

6.2.2.5 No. 1 Sewage Treatment Plant

The sample did not contain concentrations that exceeded their respective screening standards.

6.2.2.6 S-48

The samples did not contain concentrations that exceeded their respective screening standards.

6.2.2.7 T-50

The samples did not contain concentrations that exceeded their respective screening standards.

6.2.2.8 S-49

The samples did not contain concentrations that exceeded their respective screening standards.

6.2.3 East Stand Area

In the East Stand Area, a total of 24 concrete, three cinder block, two caulk, two soil, and two water samples were collected from a total of 13 buildings/structures (Test Stand 2 [R-2]; R-33; R-29; R-21; Test Stand 3 [R-3]; R-51; Test Stand 4 [R-4]; Cistern/Cistern Pump; Scrubber; Water Cooling Tower; Condenser and Hotwell; Water Tower; and Agitator and Effluent Treatment Basin). The

following summarizes the analytical results that exceeded their respective screening standards:

6.2.3.1 Test Stand 2 (R-2)

Concrete Sample

- Total PCBs were detected in sample R2-CON-02 at a concentration of 0.63 mg/kg which exceeds the RDCSRS screening standard.

6.2.3.2 R-33

The samples did not contain concentrations that exceeded their respective screening standards.

6.2.3.3 R-29

The sample did not contain concentrations that exceeded their respective screening standards.

6.2.3.4 R-21

Concrete Sample

- Benzo(a)anthracene was detected in sample R21-CON-02 at a concentration of 0.7 J mg/kg which exceeds the RDCSRS screening standard.
- Total PCBs were detected in sample R21-CON-01 at a concentration of 14 mg/kg, which exceeds both the RDCSRS and Non-RDCSRS screening standards.
- Dieldrin was detected in sample R21-CON-01 at a concentration of 0.12 NJ mg/kg, which exceeds the RDCSRS screening standard.

Soil Sample

- Benzo(a)pyrene was detected in sample R21-SOIL-R1 at a concentration of 0.35 J mg/kg, which exceeds both the RDCSRS and Non-RDCSRS screening standards.

Caulk Sample

- Total PCBs were detected in the sample at a concentration of 2.1 mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standards.

Cinder Block Sample

- Total PCBs were detected in the sample at a concentration of 0.62 mg/kg which exceeds both the RDCSRS and Non-RDCSRS screening standards.

6.2.3.5 Test Stand 3 (R-3)

The samples did not contain concentrations that exceeded their respective screening standards.

6.2.3.6 R-51

The samples did not contain concentrations that exceeded their respective screening standards.

6.2.3.7 Test Stand 4 (R-4)**Concrete Sample**

- Lead was detected in sample R4-CON-01 at a concentration of 406 mg/kg which exceeds the RDCSRS screening standard.
- Total PCBs were detected in samples R4-CON-04 and R4-CON-06 at concentrations of 0.5 mg/kg and 1.1 mg/kg, respectively. R4-CON-04 exceeded the RDCSRS screening standard and R4-CON-06 exceeded both the RDCSRS and Non-RDCSRS screening standards.

6.2.3.8 Cistern/Cistern Pump

- At sample location Cistern-Water-01 duplicate sample Cistern-Water-R8 had a detection for chromium at 0.0453 J mg/L, which exceeded both the fresh water acute screening standard and the fresh water chronic screening standard. Sample Cistern-Water-01 had a detection for lead at 0.0147 mg/L, which exceeded the fresh water chronic screening standard.
- PCBs were detected in the duplicate at a concentration of 0.0057 mg/L. The concentrations exceed the fresh water chronic screening standard.

6.2.3.9 Scrubber

The sample did not contain concentrations that exceeded their respective screening standards.

6.2.3.10 Water Cooling Tower

The sample did not contain concentrations that exceeded their respective screening standards.

6.2.3.11 Condenser and Hotwell**Concrete Sample**

- Total PCBs were detected in sample COND/HW-CON-02 at a concentration of 0.21 mg/kg which exceeded the RDCSRS screening standard.

6.2.3.12 Water Tower

The sample did not contain concentrations that exceeded their respective screening standards. However, the sample contained concentrations of petroleum hydrocarbons C6-C10, which do not have screening standards. The petroleum hydrocarbons C6-C10 and lead results had a higher concentration in the upper phase sample which was mostly oil.

6.2.3.13 Agitator and Effluent Treatment Basin

The samples did not contain concentrations that exceeded their respective screening standards.

Table 6-1 also includes a summary of analytical results which exceeded their respective screening standards.

Table 6-1 Summary of Analytical Results Exceeding Screening Standards

Building/Structure Material		Exceedances
P2 Area		
R-47		
Concrete		total PCBs Pesticides: 4,4-DDE, Dieldrin, gamma-BHC (Lindane), gamma- Chlordane
Cinder block		TAL Metals: Arsenic, Lead, Manganese total PCBs
Paint Locker		
Cinder block		SVOCs: Benzo(a)anthracene, Benzo(a)pyrene
Caulk		total PCBs
R-34		
Concrete		TAL Metals: Antimony total PCBs
Cinder block		total PCBs
Oil		total PCBs
South Stand Area		
S-12		
Concrete		total PCBs
Caulk		total PCBs
S-46		
Concrete		total PCBs
Pesticides		Pesticides: Dieldrin, gamma-Chlordane
Cinder block		total PCBs
Caulk		total PCBs
East Stand Area		
R-2		
Concrete		Total PCBs
R-21		
Concrete		SVOCs: Benzo(a)anthracene, total PCBs Pesticides: Dieldrin

Table 6-1 Summary of Analytical Results Exceeding Screening Standards

Building/Structure Material		Exceedances
Cinder block		total PCBs
Caulk		total PCBs
Soil		SVOCs: Benzo(a)pyrene
R-4		
Concrete		TAL Metals: Lead total PCBs
Condenser and Hotwell		
Concrete		total PCBs
Cistern/Cistern Pump		
Water		TAL Metals: Chromium, Lead total PCBs Pesticides: gamma-Chlordane

The NJDEP Solid and Hazardous Waste Management Program Guidance for Characterization of Concrete and Clean Material Certification for Recycling (Updated January 12, 2010) (NJDEP 2010) considers materials containing any contaminant exceeding the NJDEP RDCSRS as solid wastes. Therefore, the buildings/structures listed in Table 6-1 are considered solid wastes because they exceeded the NJDEP RDCSRS.

6.3 Asbestos and Lead Based Paint Summary

YU conducted a hazardous materials investigation for the buildings/structures located in OU3. The purpose of the investigation was to identify the types and locations of ACM and LBP (see Appendix B).

ACM was identified in the following locations:

- **P2 Area:** Building R-47, the Igniter Storage Building, Pump House 2, and Building R-34. ACM in the P2 Area includes various floor tiles and associated mastic, window caulking, tar, pipe insulation, transite, and cloth cushions. The cloth cushion appears to be a part of abandoned machinery assumed to be used as an air-handling unit.
- **South Stand Area:** Test Stand 12 (S-12), Building S-46, Test Stand 11 (S-11), and Test Stand 37 (S-37). ACM in the South Stand Area includes various floor tiles and associated mastic, door caulking, window caulking, flashing, tar, roofing tar paper, and transite.
- **East Stand Area:** Building R-29, Building R-21, the Old Water Tower, the Building associated with the Old Water Tower, Building R-51, Building R-4, and the Water Cooling Tower. ACM in the East Stand Area includes various floor tiles and associated mastic, joint material, window caulking and glazing, tar and tar sealant, pipe insulation, and thermal system insulation (TSI) fittings/elbows.

These ACMs need to be abated prior to renovation or demolition per the NJDEP Guidance Document for the Management of ACM (NJDEP 2013).

A total of 424 XRF readings, plus the appropriate calibrations were taken within the project area. A total of 21 structures/buildings were screened for presence/absence of LBP and 14 structures were determined either to not have any painted components or were not identified. In addition to the XRF testing, bulk paint chip samples were also collected by YU to check the consistency with XRF testing. Out of 36 bulk paint samples tested, 19 samples had lead concentrations greater than 0.5% by dry weight or 1 mg/cm² (ranging from 0.51% to 16% by dry weight and 1 to 45 mg/cm²). A report documenting the results is included in Appendix B. LBP was identified in the following locations:

- **P2 Area:** LBP was identified by XRF screening as being present at Building R-47, Paint Locker, Igniter Storage, Building R-43, and Building R-34. LBP was identified by paint chip sampling and analysis at Building R-47, Paint Locker, Igniter Storage, Building R-43, and Building R-34.
- **South Stand Area:** LBP was identified by XRF screening as being present at Building S-46 on metal doors and a block window sill. LBP was identified by paint chip sampling and analysis at Building S-46.
- **East Stand Area:** LBP was identified by XRF screening as being present at Pump House 3, Test Stand 3 (R-3), the Old Water Tower, the Building Associated with the Old Water Tower, and Building R-4. LBP was identified by paint chip sampling and analysis at Test Stand 2 (R-2), Building R-33, the Old Water Tower, the Building Associated with the Water Tower, Building R-3 (Test Stand 3), R-21, and Building R-4.

6.4 Cultural Resources Summary

Hartgen conducted a National Register eligibility evaluation of the OU3 structures and buildings. A report documenting the results of this evaluation is included in Appendix A. Results of the National Register eligibility evaluation indicated that none of the structures and buildings included in the RI have been recommended individually eligible for inclusion in the NRHP. However, these structures and buildings can be collectively recommended as contributing elements of a single NRHP-eligible historic property, potentially referred to as the Reaction Motors Lake Denmark Historic District, which is contiguous with the boundaries of the RTI property (see Appendix A). The results of the National Register eligibility evaluation are presented in Section 3.1.7.

Additional structures, buildings, and other built resources, such as roads, berms, and other hardscaping and landscaping features, which were not evaluated for the RI, are within the proposed boundaries of the historic district. It is possible that the proposed NRHP-eligible historic district may contain archaeologically sensitive areas and/or previously unidentified archaeological sites, including sites that may be NRHP-eligible.

6.5 Screening Level Risk Assessment Summary

Potential risks and hazards to receptor populations were not calculated as part of the screening level risk assessment because the available data was not suitable for that purpose (see Section 5).

There are a number of sources of uncertainty in this screening level risk assessment. Several chemicals that were measured analytically lack screening levels because they lack quantitative toxicity values. Calcium, magnesium, potassium, and sodium lack toxicity values because they are found throughout the body and are considered essential nutrients. Other chemicals exist in several forms that can be measured analytically but for which separate toxicity values have not been established. In these cases screening levels for the parent compound or a very closely related compound were used as surrogates.

As mentioned previously in Section 5, a number of chemicals were not detected at detection limit concentrations higher than their RBSLs. It is possible that some of these chemicals could be present at some concentration between zero and their detection limits. If present at undetected concentrations greater than their RBSLs they could present an undetected risk or hazard.

6.6 Conclusions

No imminent threats were identified in OU3 based on the results of the RI. The following is a summary of general conclusions derived from this investigation:

- The buildings/structures listed in Table 6-1 consist of building materials that contain contaminants that exceed the NJDEP RDCSRS and need to be disposed of as solid wastes. These materials cannot be reused or recycled if removed from the site (NJDEP 2010).
- For buildings/structures that had a limited number of minor exceedances (e.g., Paint Locker, R-2, Condenser, and Hotwell), no action is recommended at this time.
- Prior to any future action associated with the buildings/structures (e.g., demolition, refurbishing), the analytical results presented in this RI should be considered.
- ACM inspection results show that many of the building materials analyzed were determined to be friable ACM that is in poor condition. The poor condition of identified ACM may pose a threat to public health and safety. These ACMs need to be abated prior to renovation or demolition per the NJDEP Guidance Document for the Management of ACM (NJDEP 2013).
- LBP inspection results concluded that removal of LBP prior to demolition activities is not required since no multi-family housing or children under the age of seven years old are currently at the RTI site. Demolition work must comply with Occupational Safety and Health Administration Worker Protection Rule and with EPA RCRA requirements that govern disposal of

lead contaminated waste. Metal components along with LBP can be recycled at a facility permitted/approved to accept such scrap metal.

- Due to the proximity of the water tower to a walking path, a structural integrity analysis of the water tower is recommended to ensure that it is safe. The water tower is located in the East Stand Area (see Figure 1-2).

6.7 Recommendations for Cultural Resources and Historic Properties

6.7.1 Additional Cultural Resources Investigations

Prior to implementing further remediation activities at the site, it is recommended that the EPA conduct additional cultural resources investigations. Additional NRHP-eligibility evaluation is recommended for the architectural and built resources at the site that were not included in the RI to determine whether they are individually NRHP-eligible and/or whether they are contributing elements of a potential historic district. It is also recommended that archaeological investigations be conducted at the site, particularly prior to any ground disturbing activities, to determine whether archaeological resources are present (e.g., prehistoric, historic or industrial archaeological sites) and, if present, to determine whether the identified archaeological resources are NRHP-eligible individually or as contributing elements of a potential historic district.

6.7.2 Compliance with Section 106 of the National Historic Preservation Act of 1966, as amended

It is recommended that the EPA evaluate the need to comply with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and its implementing regulations at 36 CFR Part 800 prior to implementing further remediation activities for the property because Hartgen has concluded that a potential NRHP-eligible historic district is present at the RTI property. Section 106 of the NHPA requires federal agencies, such as the EPA, to take into account the effects of their undertakings, such as remediation activities, on historic properties and afford the ACHP a reasonable opportunity to comment on such undertakings (ACHP 2004).

It is recommended that EPA initiate the procedures for Section 106 compliance, codified in 36 CFR Part 800, which require federal agencies, such as the EPA, to evaluate their proposed undertakings to determine whether they have the potential to adversely affect historic properties prior to implementing the proposed undertaking; identify historic properties within an undertaking's area of potential effects; and determine the effects of an undertaking on historic properties. The Section 106 compliance process includes consultation with the State Historic Preservation Officer, federally recognized Indian tribes, and other consulting parties (ACHP 2004).

7

References

Acres International Corporation. 1991. Remedial Investigation Report, Volume I of IV, September 1991.

Advisory Council on Historic Preservation (ACHP). 2004. 36 CFR Part 800 – Protection of Historic Properties (incorporating amendments effective August 5, 2004). Accessed online at <http://www.achp.gov/regs-rev04.pdf>. Web site accessed July 17, 2013.

Ecology and Environment, Inc. (E & E). 2012. *Technical Evaluation Memorandum for the Radiation Technology Superfund Site, Operable Unit 3, Contract No. W912DQ-11-D3006*.

_____. 2013a. Project-Specific Quality Assurance Project Plan for Remedial Investigation for the Radiation Technology, Inc. Superfund Site, Operable Unit 3 Rockaway Township, Morris County, New Jersey.

_____. 2013b. *Remedial Investigation, Field Sampling Plan for the Radiation Technology Superfund Site, OU3, Contract No. W912DQ-11-D-3006*.

Conestoga-Rovers & Associates (CRA). 2010. *Remedial Investigation Report, Operable Unit 2, Radiation Technology Inc. Superfund Site, Rockaway Township, New Jersey*. Ref No. 004354 (22). August 2010.

_____. 2011. Draft Pre-Remedial Design Investigation Report, Operable Unit 1, Radiation Technology Inc., Superfund Site, Rockaway Township, New Jersey.

Cultural Resource Consulting Group (CRCG). 2007. *Phase IA Cultural Resource Reconnaissance, Radiation Technology, Inc. Superfund Site, 108 Lake Denmark Road, Morris County, New Jersey*. CRCG# 06-161-01. January 8, 2007.

Conserve Wildlife Foundation of New Jersey (CWF). 2013. <http://www.conservewildlifenj.org/species/fieldguide/view/Lynx%20rufus/>, website accessed on July 25, 2013.

- Federal Emergency Management Agency (FEMA). 2013.
<https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>, accessed on June 14, 2013.
- Lockheed Martin Technology Services/Environmental Services Response Engineering Analytical Contract (REAC). 2005. Sampling Activities at the RTI Site. Work Assignment EAC00123RTI – Trip Report. June 10, 2005.
- Lockheed Martin SERAS. 2010. Site Activities January 29, 2010, March 24, 2010, April 1, 2010, and April 22, 2010, RTI Site, Work Assignment No.: SERAS-063. August 10, 2010.
- New Jersey Department of Environmental Protection (NJDEP). 2013. Guidance Document for the Management of ACM, updated January 11, 2013, <http://www.nj.gov/dep/dshw/rtp/asbestos.htm>.
- _____. 2012. i-MapNJ.
<http://www.nj.gov/dep/gis/depsplash.htm#>. Accessed October 9, 2012.
- _____. 2010. *The New Jersey Department of Environmental Protection Solid and Hazardous Waste Management Program Guidance for Characterization of Concrete and Clean Material Certification for Recycling* (Updated January 12, 2010).
- New Jersey Department of Environmental Protection Natural Heritage Program, (NJNHP) 2013.
<http://www.nj.gov/dep/parksandforests/natural/heritage/rarelist.html>, accessed on June 13, 2013.
- National Park Service (NPS). 1997. How to Apply the National Register Criteria for Evaluation. U.S. Department of the Interior, Washington, D.C.
- Pennsylvania Department of Conservation and Natural Resources (PADCNR). 2012. Landforms of Pennsylvania from Map 13, Physiographic Provinces of Pennsylvania.
<http://www.dcnr.state.pa.us/topogeo/field/map13/index.htm> accessed on November 24, 2012.
- Sims, P.K. and A.F. Buddington. 1958. Geology and Magnetite Deposits of Dover District, Morris County, New Jersey, with a description of the geologic section at Hibernia mine. USGS Professional Paper 287.
- U.S. Department of Agriculture (USDA). 2013. Web Soil Survey, <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>, accessed on June 13, 2013.

- _____. 2010. Natural Resources Conservation Service, Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed October 9, 2012.
- _____. 1976. Soil Conservation Service. Soil Survey of Morris County, New Jersey.
- U.S. Department of the Interior, National Park Service. 1995. *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*. Accessed online at <http://www.nps.gov/history/nr/publications/bulletins/pdfs/nrb15.pdf> (web site accessed July 17, 2013).
- United States Environmental Protection Agency (EPA), 2013a, Regional Screening Table, available on line at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm, May 2013.
- _____, 2013b, Regional Screening Table User's Guide (May 2013), available on line at: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm, May 2013.
- _____, 2012, Regional Removal Management Levels for Chemicals (RMLs), available on line at: <http://www.epa.gov/region4/superfund/programs/riskassess/rml/rmlgentable.html>.
- _____. 2008. Fact Sheet: Mercury Gas Regulators. <http://www.epa.gov/region07/factsheets/2008mercurygasregulators05062008.htm>.
- _____. 1994. EPA Superfund Record of Decision: Radiation Technology, Inc., EPA ID: NJD047684451, OU 01, Rockaway Township, NJ, 05/09/1994.
- U.S. Fish and Wildlife Service (USFWS). 2013a. Environmental Conservation Online System, <http://ecos.fws.gov/ecos/indexPublic.do>, accessed on June 13, 2013.
- _____. 2013b. <http://www.fws.gov/endangered/species/>, website accessed on July 25, 2013.
- United States Geological Survey (USGS). 2012. Highlands Sites in New Jersey. <http://3dparks.wr.usgs.gov/nyc/highlands/ramapo.htm/>. Accessed October 9, 2012.

Woodhouse-Beyer. 2007. Phase IA Cultural Resource Reconnaissance, Radiation Technology, Inc. Superfund Site, 108 Lake Denmark Road, Rockaway Township, Morris County, New Jersey. Prepared by Katharine Woodhouse-Beyer, Ph.D., Peter Mickulas, Ph.D., Charles A. Bello, MA, RPA, Cultural Resource Consulting Group.